

Aristotle

*Metaphysics*



Aristotle

*Metaphysics*

Translated  
With Introduction and Notes  
By

C. D. C. Reeve

Hackett Publishing Company, Inc.  
Indianapolis/Cambridge

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Printed in the United States of America

19 18 17 16      1 2 3 4 5 6 7

For further information, please address

Hackett Publishing Company, Inc.

P.O. Box 44937

Indianapolis, Indiana 46244-0937

[www.hackettpublishing.com](http://www.hackettpublishing.com)

Cover design by Deborah Wilkes

Interior design by Elizabeth L. Wilson

Composition by Aptara, Inc.

**Library of Congress Cataloging-in-Publication Data**

Aristotle, author.

[Metaphysics. English]

Metaphysics / Aristotle ; translated with introduction and notes by

C.D.C. Reeve.

pages cm

Includes bibliographical references and index.

ISBN 978-1-62466-439-7 (pbk.) — ISBN 978-1-62466-440-3 (cloth)

1. Metaphysics—Early works to 1800. I. Reeve, C. D. C., 1948– II. Title.

B434.A5R44 2016

110—dc23

2015036145

The paper used in this publication meets the minimum requirements of American National Standard for Information Sciences—Permanence of Paper for Printed Library Materials, ANSI Z39.48–1984.



*For*

My Teachers and Students

εἰ δὲ μὴ Φρύνις, Τιμόθεος οὐκ ἂν ἐγένετο



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## Preface

Readers of the *Metaphysics* in translation often find themselves in territory whose apparent familiarity is somewhat deceptive and inimical to proper understanding. *Epistêmê* isn't quite science, *theôria* isn't quite theory, *aition* isn't quite cause, *archê* isn't quite first principle, *ousia* isn't quite substance, *to on* isn't quite being, *to ti ên einai* isn't quite essence. Even what the *Metaphysics* is about isn't quite metaphysics as we know it. A worthwhile translation must try to compensate for this deceptive familiarity without producing too much potentially alienating distance and strangeness in its place.

Accuracy and consistency are essential to achieving this goal, obviously, but so too are extensive annotation and commentary. Some of this can consist, as it does here, of texts selected from other works by Aristotle himself, so that, while traveling through the region of the Aristotelian world the *Metaphysics* describes, the reader can also travel through other regions of it, acquiring an ever widening and deepening grasp on the whole—something that is crucial, in my view, to understanding any part of it adequately or, perhaps, at all. But much commentary must simply be explanatory, clarificatory, and interpretative.

To make the journey as convenient as possible footnotes and glossary entries are replaced by sequentially numbered endnotes, so that the information most needed at each juncture is available in a single place. The non-sequential reader, interested in a particular passage, will find in the detailed Index of Terms a guide to places where focused discussion of a term or notion occurs. The Glossary shows key Greek terms and their English equivalents. The Introduction describes the book that lies ahead, explaining what it is about, what it is trying to do, how it goes about doing it, and what sort of audience it presupposes. It isn't a comprehensive discussion of all the important topics in the *Metaphysics*, nor an attempt to situate Aristotle's thought in the history of metaphysics more generally. Many books exist that attempt these tasks, some of which are mentioned under Further Reading. Nor is it, I should add, an expression of scholarly consensus on the issues it does discuss—insofar as such a thing exists—but my own take on them. The same goes for many of the more interpretative notes. They are a place to start, not a place to finish—a first step in the vast dialectical enterprise of coming to understand Aristotle for oneself.

Some readers will, I have assumed, be new to the *Metaphysics*, without much background in philosophy generally or in Ancient Greek philosophy in particular, so I have tried to keep their needs in mind. I have also had in mind, though, the needs of more advanced readers, who require an English version that is sufficiently reliable and informed for their purposes.

I have benefited from the work of previous translators and commentators, especially David Ross, whose magisterial edition of the Greek text, commentary on it, and translation of it have been essential. The various volumes in the Clarendon Aristotle Series have also often been helpful, as have the Symposium Aristotelicum volumes devoted to Books Alpha, Beta, and Lambda, the edition of Book Zeta with German translation by Michael Frede and Günther Patzig, the “map” of Zeta by Myles Burnyeat, and the translations of Zeta, Eta, Theta, and Iota by Montgomery Furth.

As in the case of my translation of the *Nicomachean Ethics* (Indianapolis, 2014), I am deeply indebted to my friend Pavlos Kontos for reading every line of this one, suggesting numerous improvements, and correcting many errors. I am also indebted to David Riesbeck for his very careful reading of the translation and for his many, always perceptive, notes and comments. I’m indebted, too, to Michael Smith for spotting many typos in the penultimate draft. Finally, I am very happy to thank my co-editor of *Readings in Ancient Greek Philosophy*, Marc Cohen, for reading much more of the *Metaphysics* than appears in that volume and making numerous helpful suggestions.

Equal devotion to Greek philosophical texts, albeit of a different sort, has again been demonstrated by Deborah Wilkes and her colleagues at Hackett Publishing Company, who have been my publishers, supporters, and friends for over twenty-five years.

While I was at work on the *Metaphysics* I had the good fortune to teach a joint seminar on it with Mariska Leunissen and to profit from discussions with her, with other members of the seminar, and with Michael Peramatzis, our guest speaker. I am grateful to Marc Lange, chair of the Philosophy Department of the University of North Carolina at Chapel Hill, for providing funds to bring Michael to the seminar and for his many other kindnesses. I am grateful, too, to Panos Dimas for inviting me to attend the twentieth Aristotelian meeting of the European Society of Ancient Philosophy in Athens (April 2104), which was devoted to Zeta 10 and 11, and to present there some of what now appears in the notes to 1034<sup>b</sup>20–1035<sup>a</sup>25.

I renew my thanks to ΔΚΕ, the first fraternity in the United States to endow a professorial chair, and to the University of North Carolina for

awarding it to me. The generous research funds, among other things, that the endowment makes available each year have allowed me to travel to conferences and to acquire books, computers, and other research materials and assistance, without which my work would have been much more difficult.

## Abbreviations

### *Aristotle*

Citations of Aristotle's works are made to Immanuel Bekker, *Aristotelis Opera* (Berlin: 1831 [1970]), in the canonical form of abbreviated title, book number (when the work is divided into books), chapter number, page number, column letter, and line number. In the case of the *Metaphysics*, however, Greek letters replace book numbers, as is most common, and the title of the work is omitted. An \* indicates a work whose authenticity has been seriously questioned, \*\* indicates a work attributed to Aristotle but generally agreed not to be by him. The abbreviations used are as follows:

APo.	<i>Posterior Analytics</i>
APr.	<i>Prior Analytics</i>
Cael.	<i>De Caelo (On the Heavens)</i>
Cat.	<i>Categories</i>
DA	<i>De Anima (On the Soul)</i>
Div. Somn.	<i>On Divination in Sleep</i> (Ross)
EE	<i>Eudemian Ethics</i>
GA	<i>Generation of Animals</i>
GC	<i>On Generation and Corruption</i> (Joachim)
HA	<i>History of Animals</i> (Balme)
IA	<i>Progression of Animals (De Incessu Animalium)</i>
Int.	<i>De Interpretatione</i>
juv.	<i>On Youth and Old Age, Life and Death, and Respiration</i> (Ross)
LI	<i>On Indivisible Lines</i> **
Long.	<i>On Length and Shortness of Life</i> (Ross)
MA	<i>Movement of Animals</i> (Nussbaum)
MM	<i>Magna Moralia</i> * (Sussemihl)



<i>Mech.</i>	<i>Mechanics**</i>
<i>Mem.</i>	<i>On Memory</i> (Ross)
<i>Mete.</i>	<i>Meteorology</i>
<i>NE</i>	<i>Nicomachean Ethics</i>
<i>Oec.</i>	<i>Economics*</i>
<i>PA</i>	<i>Parts of Animals</i>
<i>Ph.</i>	<i>Physics</i>
<i>Po.</i>	<i>Poetics</i>
<i>Pol.</i>	<i>Politics</i>
<i>Pr.</i>	<i>Problems*</i>
<i>Protr.</i>	<i>Protrepticus</i> (Düring)
<i>Rh.</i>	<i>Rhetoric</i>
<i>SE</i>	<i>Sophistical Refutations</i>
<i>Sens.</i>	<i>Sense and Sensibilia</i>
<i>Somn.</i>	<i>On Sleep</i>
<i>Top.</i>	<i>Topics</i>

I cite and translate the *Oxford Classical Texts* (OCT) editions of these works, where available, otherwise Bekker or the editions noted:

Balme, D. M., *Aristotle: Historia Animalium* (Cambridge, 2002).

Düring, Ingemar, *Aristotle's Protrepticus: An Attempt at Reconstruction* (Göteborg, 1961).

Joachim, H. H., *Aristotle on Coming-to-Be and Passing-Away* (Oxford, 1926).

Mayhew, Robert, *Aristotle: Problems* (Cambridge, Mass., 2011).

Nussbaum, Martha C., *Aristotle's De Motu Animalium: Text with Translation, Commentary, and Interpretative Essays* (Princeton, 1978).

Rose, V., *Aristotelis Fragmenta* 3rd ed. (Leipzig, 1886).

Ross, W. D., *Aristotle Parva Naturalia* (Oxford, 1955).

Susemihl, F., *Aristotelis Magna Moralia* (Leipzig, 1883).

## Plato

Ap.	Apology
Chrm.	Charmides
Crat.	Cratylus
Epin.	Epinomis
Euthd.	Euthydemus
Euthphr.	Euthyphro
Grg.	Gorgias
Hp. Mi.	Hippias Minor
Lg.	Laws
Men.	Meno
Phd.	Phaedo
Phlb.	Philebus
Pol.	Statesman
Prm.	Parmenides
Phdr.	Phaedrus
Prt.	Protagoras
Rep.	Republic
Smp.	Symposium
Sph.	Sophist
Tht.	Theaetetus
Ti.	Timaeus

Translations of Plato in the notes are based on those in J. M. Cooper, ed., *Plato: Complete Works* (Indianapolis, 1997) and on my *The Trials of Socrates* (Indianapolis, 2002) and *Plato: Republic* (Indianapolis, 2004).

## Other Abbreviations and Symbols

Alex. In. *Metaph.* = Haydruck, M. ed. *Alexandri Aphrodisiensis in Aristotelis Metaphysica Commentaria* (Berlin, 1891).

Annas = J. Annas, *Aristotle's Metaphysics Books M and N* (Oxford, 1976).

- Barker = A. Barker, *Greek Musical Writings II: Harmonic and Acoustic Theory* (Cambridge, 1989).
- Barnes = J. Barnes, *The Complete Works of Aristotle: The Revised Oxford Translation* (Princeton, 1984).
- Bostock = D. Bostock, *Aristotle Metaphysics Books Z and H* (Oxford, 1994).
- DK = H. Diels and W. Kranz, eds., *Die Fragmente der Vorsokratiker* 6th ed. (Berlin, 1951).
- DL = Diogenes Laertius, *Lives of Eminent Philosophers*, ed. T. Dorandi (Cambridge, 2013).
- Dooley 1 = W.E. Dooley, S. J., tr., *Alexander of Aphrodisias, On Aristotle's Metaphysics I* (Ithaca, 1989).
- Dooley 5 = *Alexander of Aphrodisias, On Aristotle's Metaphysics 5* (Ithaca, 1993).
- Dooley & Madigan = W. E. Dooley, S. J., and A. Madigan, S. J., tr., *Alexander of Aphrodisias, On Aristotle's Metaphysics 2 & 3* (Ithaca, 1992).
- Fine = G. Fine, *On Ideas: Aristotle's Criticism of Plato's Theory of Forms* (Oxford, 1993).
- FP = M. Frede and G. Patzig, *Aristoteles Metaphysik Z: Text, Übersetzung und Kommentar* (München, 1988).
- Furth = M. Furth, *Aristotle Metaphysics, Books Zeta, Eta, Theta, Iota* (Indianapolis, 1985).
- Huffman = C. A. Huffman, *Archytas of Tarentum: Pythagorean, Philosopher and Mathematician King* (Cambridge, 2005).
- Isnardi = M. Isnardi Parente and T. Dorandi, *Senocrate e Ermodoro, Testimonianze e Frammenti* (Pisa, 2012).
- Laks = André Laks, "Metaphysics  $\Lambda$  7," in M. Frede and D. Charles (eds.), *Aristotle's Metaphysics Lambda* (Oxford, 2000).
- Madigan = A. Madigan, S. J., tr., *Alexander of Aphrodisias, On Aristotle's Metaphysics 4* (Ithaca, 1993).
- Makin = S. Makin, *Aristotle Metaphysics Books  $\Theta$*  (Oxford, 2006).
- PEM = Principle of Excluded Middle.
- PNC = Principle of Non-contradiction.
- Primavesi = O. Primavesi, "Metaphysics A: A New Critical Edition with Introduction." In C. Steel (ed.), *Aristotle's Metaphysics Alpha* (Oxford, 2012).
- R<sup>3</sup> = V. Rose, *Aristotelis Fragmenta* 3rd ed. (Leipzig, 1886).
- Ross = W. D. Ross, *Aristotle's Metaphysics* (Oxford, 1924).
- Schiefsky = M. J. Schiefsky, *Hippocrates on Ancient Medicine: Translated with an Introduction and Commentary* (Leiden, 2005).

## Abbreviations

SSR = G. Giannantoni, *Socratis et Socraticorum Reliquiae* (Naples, 1990).

Tarán = L. Tarán, *Speusippus of Athens* (Leiden, 1981).

TEGP = D. W. Graham, *The Texts of Early Greek Philosophy: The Complete Fragments and Selected Testimonies of the Major Presocratics* (Cambridge, 2010).

West = M. L. West, *Delectus ex Iambis et Elegis Graecis* (Oxford, 1980).

$A = B$  = A is identical to (equivalent to) B.

$A =_{\text{def}} B$  = A is identical to B by definition.

$A \approx B$  = A is roughly the same as or roughly equivalent or analogous to B.

$A \supset B$  = If A then B, or A implies B.

$\Box A$  = It is necessary that A.

$\Diamond A$  = It is possible that A.

## Introduction

### *Life and Works*

Aristotle was born in 384 BC to a well-off family living in the small town of Stagira in northern Greece. His father, Nicomachus, who died while Aristotle was still quite young, was allegedly doctor to King Amyntas of Macedon. His mother, Phaestis, was wealthy in her own right. When Aristotle was seventeen his guardian, Proxenus, sent him to study at Plato's Academy in Athens. He remained there for twenty years, initially as a student, eventually as a researcher and teacher. When Plato died in 347, leaving the Academy in the hands of his nephew, Speusippus, Aristotle left Athens for Assos in Asia Minor, where the ruler, Hermias, was a patron of philosophy. He married Hermias' niece, Pythias, and had a daughter by her, also named Pythias. Three years later, in 345, after Hermias had been killed by the Persians, Aristotle moved to Mytilene on the island of Lesbos, where he met Theophrastus, who was to become his best student and closest colleague.

In 343 Aristotle seems to have been invited by Philip of Macedon to be tutor to the latter's thirteen-year-old son, Alexander, later called "the Great." In 335, Aristotle returned to Athens and founded his own institute, the Lyceum. While he was there his wife died and he established a relationship with Herpyllis, also a native of Stagira. Their son Nicomachus was named for Aristotle's father, and the *Nicomachean Ethics* may, in turn, have been named for him or transcribed by him. In 323 Alexander the Great died, with the result that anti-Macedonian feeling in Athens grew stronger. Perhaps threatened with a formal charge of impiety (NE X 7 1177<sup>b</sup>33), Aristotle left for Chalcis in Euboea, where he died twelve months later, in 322, at the age of sixty-two.

Legend has it that Aristotle had slender calves, small eyes, spoke with a lisp, and was "conspicuous by his attire, his rings, and the cut of his hair." His will reveals that he had a sizable estate, a domestic partner, two children, a considerable library, and a large circle of friends. In it Aristotle asks his executors to take special care of Herpyllis. He directs that his slaves be freed "when they come of age" and that the bones of his wife, Pythias, be mixed with his "as she instructed."

Although the surviving writings of Aristotle occupy almost 2,500 tightly printed pages in English, most of them are not works polished for publication but sometimes incomplete lecture notes and working papers. This accounts for some, though not all, of their legendary difficulty. It is unfair to complain, as a Platonist opponent did, that Aristotle “escapes refutation by clothing a perplexing subject in obscure language, using darkness like a squid to make himself hard to catch,” but there is darkness and obscurity enough for anyone, even if none of it is intentional. There is also a staggering breadth and depth of intellect. Aristotle made fundamental contributions to a vast range of disciplines, including logic, metaphysics, epistemology, psychology, ethics, politics, rhetoric, aesthetics, zoology, biology, physics, and philosophical and political history. When Dante called him “the master of those who know,” he was scarcely exaggerating.

## *The Metaphysics and Its Structure*

One thing we might mean by the *Metaphysics* is what we now find in the pages that make up Werner Jaeger’s Oxford Classical Text (OCT) edition of the Greek text, first published in 1957, which is the basis of the present translation. This is the descendant of texts derived—via manuscripts copied in the Byzantine period (from the tenth to the fifteenth centuries AD)—from manuscripts that derive in turn from the edition of Aristotle’s works produced by Andronicus of Rhodes in the first century BC. Thus Jaeger’s edition, like most other modern editions, records in the textual apparatus at the bottom of the page various manuscript readings alternative to the one he prints in the body of his text. In some cases, I have preferred one of these readings, or some other reading suggested by an editor, indicating my preference in the associated notes. It is widely recognized, it should be said, that no entirely satisfactory edition of the Greek text is currently available. Nonetheless, when mss. E and A<sup>b</sup> or J and A<sup>b</sup> agree, there is some consensus among experts that the text is on safe ground—or is so, anyway, up to A 7 1073<sup>1</sup>. At that point, A<sup>b</sup> seems to be a copy of a lost manuscript closely related to J, so that E and J on the one hand and M and C on the other become the ones whose agreement renders the ground reasonably safe.\*

Also present in Jaeger’s text, as in all worthwhile modern editions, are book and chapter divisions provided by editors, as well as the page numbers of Bekker, *Aristotelis Opera*. Here its page numbers, column letters,

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\*With the exception of C (= Taur. B VII 23 saeculi XV) these manuscripts are identified at OCT p. xxii.

and line numbers appear in the margins in the print edition and, in the electronic edition, between upright lines in the translation itself (for example, |1028<sup>a</sup>10|) at the end of the first line in a column to which they apply. Line numbers refer to the Greek text, however, and so are approximate in the translation. Occasional material in square brackets is inserted for purposes of clarification.

The second thing we might mean by the *Metaphysics* is the work itself, so to speak, the more abstract entity that is embodied in a good edition of the Greek text and (ideally) in any translation of it. It is clear, however, even on a first reading, that whatever this work is it is not a polished treatise developing a single line of argument in an immediately perspicuous way.

Book Alpha begins by introducing us to the topic of the work, theoretical wisdom (*sophia*), later the science of being qua being (Γ 1 1003<sup>a</sup>21), which is concerned with being as such and with its primary causes and starting-points. It continues (A 3–10) by looking at and criticizing what earlier thinkers (especially, Plato) have said about these, concluding that none of them introduces any beyond the four (material, efficient, final, and formal) that Aristotle has himself identified and explored in the *Physics*. Beta lists and goes through a set of fourteen *aporiai* or puzzles (P1–14) that the science of being qua being must resolve, whose order and content we might expect to be setting the agenda for the rest of the work. Gamma does, to some extent, meet this expectation, since P1–4 are somewhat resolved in Γ 1–2 (although P3, for example, is also discussed in E 1). P5, on the other hand, is not discussed until the final books, Mu and Nu. P6–7 are not explicitly addressed anywhere—although Z 10 and 12 offer help with them, as Z 8, 13–14, M 10 do with P8, and Z 7–10 with P10. P9 is resolved in M 10. P11 is resolved in Z 16 and Iota 2, P12 in Z 13–15 and M 10. P13 is not addressed, though a resolution is suggested in Θ 8. P14, not referred to explicitly, is resolved in M 1–3, 6–9 and N 1–3, 5–6.

Between Alpha and Beta comes Little Alpha, and after Gamma comes Delta, neither of which is in an altogether intelligible place—especially Delta, which as a sort of dictionary of philosophical terms, might more naturally have constituted an appendix or preface to the work as a whole, even though not all of the terms are used in it (“docked,” for example), and some are discussed again. Then, after the largely coherent sequence of Epsilon, Zeta, Eta, and Theta, we have Iota, which, though it contains a resolution to P2 and is focused on unity and other central topics bearing on ultimate starting-points, is not directly connected to its predecessors. Next we have Kappa, the first half of which recapitulates parts of Beta, Gamma, and Epsilon, although not in a simply mechanical way, and the second half of which consists of a series of extracts from *Physics* II, III, and V.

The first five chapters of Lambda are connected to (roughly) the last four of Kappa, both serving to refocus the discussion on causes, rather than on the more “logical” or syncategorematic topics in Iota, with A 1–5 showing how to introduce a sort of causal uniformity into the causal diversity exemplified by the various natural sciences, each one dealing exclusively with a single genus of beings. The way is thus prepared for A 6, with its argument that there must be an eternal immovable substance if there is to be movement or change of any sort. A 7 deals with what such a substance moves and how it moves it, identifying the substance itself with the (primary) god. A 8 deals with the question of how many unmoved eternal movers we need to posit in order to explain, in the first instance, astronomical phenomena, and, in the second, phenomena elsewhere in the cosmos, including on earth. A 9–10 deal with the nature of this god and of the cosmos in which he functions as a prime mover and ruler.

After the dramatic second half of Lambda, Mu and Nu, which focus on mathematical objects, and develop a host of criticisms of Plato and others, can seem anticlimactic to a modern reader—even if we leave aside the fact that M 4–5 repeats A 9 almost word for word. But for an audience of Platonists—or one-time Platonists—the climax may have come later. For they will want to see not just an exposition of views alternative to their own, but a reason why they should abandon views they already hold in favor of these. It is not until M 10, moreover, that we encounter a resolution to a puzzle characterized as being among the very greatest (1087<sup>a</sup>13). This is the puzzle (P12), introduced in B 6 1003<sup>a</sup>5–17, restated in K 1 (1060<sup>b</sup>19–23), and discussed in Z 13 and 15, of how the starting-points of science can be universal when the primary substances (the starting-points of the science of being qua being) are particulars. When we see what it takes to solve it, we see that it merits its characterization.

None of this entails, to be sure, that the *Metaphysics* does not in the most important sense hang together philosophically, or that its central argument cannot be reconstructed. Far from it. A patient and persistent reader will find, I think, that there is more not less coherence than might seem to be the case in the light of what has just been said about the state of the text as we have it.

## What *Metaphysics* Is

The word “metaphysics” is a near transliteration of the Greek phrase *ta meta ta phusika*, which means “the things or writings that are after *ta phusika*”—after the ones devoted to natural things. It is not Aristotle’s term for anything, not even for the work—or the contents of the work—that



now has it as its title. But because that title mentions *ta phusika*, Aristotle's *Physics* is where we might reasonably begin our search for what comes after it.

In the *Physics* (some relevant bits of which are quoted or summarized, as we saw, in the second half of Kappa), Aristotle's focus is on the world of nature (*phusis*), a world pretty much coincident with the sublunary realm, consisting canonically of matter-form compounds, whose material component involves the sublunary elements—earth, water, air, and fire. Were these the only substances, the only primary beings, we learn in E 1, the science of them would be the science that the *Metaphysics* wishes to investigate, which is referred to as theoretical wisdom, the science of being qua being, and the primary science or primary philosophy. But if there are other substances, which are not composed of the sublunary elements, “that are eternal and immovable and separable,” and so prior to natural ones, the science of them will be the science of being qua being (1026<sup>a</sup>10–16).

That there must be such substances is argued already in *Physics* VIII, and that the gods, including in particular *the* (primary) god, are among them is presupposed from quite early on also in the *Metaphysics*. Thus in A 2 we hear that theoretical wisdom is the science of this god, both in having him as its subject matter and in being the science that is in some sense his science. When it is argued in A 9 that he must be “the active understanding [that] is active understanding of active understanding” (1074<sup>b</sup>34–35), we see how much *his* it is, since actively understanding itself—contemplating itself in an exercise of theoretical wisdom—is just what Aristotle's god *is*. While this is no doubt difficult to understand, Aristotle's argument for it is so probing and resourceful that we can come to understand it—or at any rate see why he thought it the only available option.

With just this much on the table there is already a puzzle whose difficulty is increased by special doctrine. Aristotle usually divides the bodies of knowledge he refers to as *epistêmata* (“sciences”) into three types: theoretical, practical, and productive (crafts). When he is being especially careful, he also distinguishes within the theoretical sciences between the strictly theoretical ones (astronomy, theology), as we may call them, and the natural ones, which are like the strictly theoretical ones in being neither practical nor productive but unlike them in consisting of propositions that—though necessary and universal in some sense—hold for the most part rather than without exception (E 1 1025<sup>b</sup>25–1026<sup>a</sup>30). Psychology, as a result, has an interestingly mixed status, part strictly theoretical (because it deals with understanding, which is something divine), part natural (because it deals with perception and memory and other capacities that require a body) (DA I 1 403<sup>a</sup>3–<sup>b</sup>16, quoted in E 1 1026<sup>a</sup>6n).

When science receives its focused discussion in the *Nicomachean Ethics*, however, Aristotle is explicit that if we are “to speak in an exact way and not be guided by mere similarities” (VI 3 1139<sup>b</sup>19), we should not call anything a science unless it deals with eternal, entirely exceptionless facts about universals that are wholly necessary and do not at all admit of being otherwise (1139<sup>b</sup>20–21). Since he is here explicitly epitomizing his more detailed discussion of science in the *Posterior Analytics* (1139<sup>b</sup>27), we should take the latter too as primarily a discussion of science in the exact sense, which it calls *epistêmê haplôs*—unconditional scientific knowledge. It follows that only the strictly theoretical sciences are sciences in this sense. It is on these that the others should be modeled to the extent that they can be: “it is the things that are always in the same state and never undergo change that we must make our basis when pursuing the truth, and this is the sort of thing that the heavenly bodies are” (K 6 1063<sup>a</sup>13–15).

Having made the acknowledgement, though, we must also register the fact that Aristotle himself mostly does not speak in the exact way but instead persistently refers to bodies of knowledge other than the strictly theoretical sciences as *epistêmai*. His division of the *epistêmai* into theoretical, practical, and productive is a dramatic case in point. But so too is his use of the term *epistêmê*, which we first encounter in the *Metaphysics* as a near synonym of *technê*, or craft knowledge, which is productive not theoretical (A 1 981<sup>3</sup>).

An Aristotelian science, although a state of the soul rather than a set of propositions in a textbook, nonetheless does involve having an assertoric grasp on a set of true propositions (NE VI 3 1139<sup>b</sup>14–16). Some of these propositions are indemonstrable starting-points (*archai*), which are or are expressed in definitions, and others are theorems demonstrable from these starting-points. We can have scientific knowledge only of the theorems, since—exactly speaking—only what is demonstrable can be scientifically known (VI 6). Yet—in what is clearly another lapse from exact speaking—Aristotle characterizes “the most rigorous of the sciences,” which is theoretical wisdom (*sophia*), as also involving a grasp by understanding (*nous*) on the truth where the starting-points themselves are concerned (VI 7 1141<sup>a</sup>16–18). He does the same thing in the *Metaphysics*, where theoretical wisdom is the *epistêmê* that provides “a theoretical grasp on the primary starting-points and causes”—among which are included “the good or the for-sake-of-which” (I 2 982<sup>b</sup>7–10). It is for this reason that the primary god’s grasp on himself through understanding is an exercise of scientific knowledge.

Now each of these sciences, regardless of what group it falls into, must—for reasons having to do with the nature of definition and demonstration—be restricted in scope to a single genus of beings (A 1 981<sup>a</sup> 3n(5)). Since

being is not itself a genus (APo. II 7 92<sup>b</sup>14), as Aristotle goes out of his way not just to acknowledge but to prove (Γ 2), it apparently follows that there should be no such science as the science of being qua being—as theoretical wisdom. To show that there is one thus takes some work.

It is a cliché of the history of philosophy that Aristotle is an empiricist and Plato a rationalist, and like all clichés there is some truth in it. In fact, Aristotle is not just an empiricist at the level of the sciences we call empirical, he is an empiricist at all levels. To see what I mean, think of each of the special, genus-specific sciences—the *first-order* sciences—as giving us a picture of a piece of the world, a region of being. Then ask, what is the world like that these sciences collectively portray? What is the nature of reality as a whole—of being as a whole? If there is no answer besides the collection of special answers, the world is, as Aristotle puts it, episodic—like a bad tragedy (Λ 10 1076<sup>a</sup>1, N 3 1090<sup>b</sup>20). But if there is an answer, it should emerge from a meta-level empirical investigation of the special sciences themselves. As each of these looks for universals (natural kinds) that stand in demonstrative causal relations to each other, so this meta-level investigation looks for higher-level universals that reveal the presence of common structures of explanation in diverse sciences:

The causes and starting-points of distinct things are distinct in a way, but in a way—if we are to speak universally and analogically—they are the same for all. . . . For example, the elements of perceptible bodies are presumably: as *form*, the hot and, in another way, the cold, which is the *lack*; and, as *matter*, what is potentially these directly and intrinsically. And both these and the things composed of them are substances, of which these are the starting-points (that is, anything that comes to be from the hot and the cold that is one [something-or-other], such as flesh or bone), since what comes to be from these must be distinct from them. These things, then, have the same elements and starting-points (although distinct things have distinct ones). But that all things have the same ones is not something we can say just like that, although *by analogy* they do. That is, we might say that there are three starting-points—the form, the lack, and the matter. But each of these is distinct for each category (*genos*)—for example, in colors they are white, black, and surface, or light, darkness, and air, out of which day and night come to be. (Λ 4 1070<sup>a</sup>31–<sup>b</sup>21)

The genus-specific sciences show the presence in the world of a variety of *different* explanatory structures. The trans-generic sciences, by finding

commonalities between these structures, show the equally robust presence there of the *same* explanatory structure: form, lack of form, matter.

The science to which form, lack, and matter belong is, in the first instance, trans-generic natural science. It is the one that would be the primary science, were there no eternal immovable substances separable from the natural ones. But there is also a trans-generic—or universal—mathematical science (E 1 1026<sup>a</sup>13–23). And the introduction of intelligible matter (Z 10 1036<sup>a</sup>11–12), as the matter of abstract mathematical objects, allows us to see a commonality in explanatory structure between the mathematical sciences and the natural ones. Between these two trans-generic sciences and the theological one (E 1 1026<sup>a</sup>19), on the other hand, the point of commonality lies not in matter, since the objects of theological science have no matter (A 6 1071<sup>b</sup>20–21), but rather in form. For what the objects of theology, divine substances (which includes human understanding or *nous*), have in common with those of mathematics and natural science is that they are forms, though—and this is the crucial point of difference—not forms in any sort of matter whatsoever. That form should be a focal topic of investigation for the science of being *qua* being is thus the result of an inductive or empirical investigation of the various genus-specific sciences, and then of the various trans-generic ones, which shows form to be the explanatory feature common to all their objects—to all beings.

It is this empirical fact that provides the science of being *qua* being with a genuine trans-generic object of study, thereby legitimating it as every bit as much a science as any generic-specific one. The science of being *qua* being is accordingly a science of form. The question now is how can that science at the same time be theology, the science of divine substance? And to it Aristotle gives a succinct answer:

We might raise a puzzle indeed as to whether the primary philosophy is universal or concerned with a particular genus and one particular nature. For it is not the same way even in the mathematical sciences but rather geometry and astronomy are concerned with a particular nature, whereas universal mathematics is common to all. If, then, there is no other substance beyond those composed by nature, natural science will be the primary science. But if there is some immovable substance, this [that is, theological philosophy] will be prior and will be primary philosophy, and it will be universal in this way, namely, because it is primary. And it will belong to it to get a theoretical grasp on being *qua* being, both what it is and the things that belong to it *qua* being. (E 1 1026<sup>a</sup>23–32)

So the primacy of theology, which is based on the fact that theology deals with substance that is eternal, immovable, and separable, is supposedly what justifies us in treating it as the universal science of being qua being.

To get a handle on what this primacy is, we need to turn to being and its structure. The first thing to grasp is that beings are divided into categories: substance, quality, quantity, relation, and so on (A 1 981<sup>a</sup>3n(7), 3 983<sup>a</sup>27–28n). But of these, only beings in the category of substance are separable, so that they alone enjoy a sort of ontological priority that is both existential and explanatory (Z 1 1028<sup>a</sup>31–<sup>b</sup>2). Other beings are attributes of different sorts, which exist only by belonging to some substance. So if we want to explain what a quality is, for example, we have to say what sort of attribute it is (Δ 14) and ultimately what in a substance is receptive of it. It is this fact that gives one sort of unity to beings: they are all either substances or attributes of substances. Hence the famous claim which ends Z 1:

Indeed, the question that was asked long ago, is now, and always will be asked, and is always raising puzzles—namely, What is being?—is just the question, What is substance? . . . And that is why we too must most of all, primarily, and (one might almost say) exclusively get a theoretical grasp on what it is that is a being in this [substantial] way. (1028<sup>b</sup>2–7)

The starting-points and causes of beings qua beings must, then, be substances. Thus while something is said to be in as many ways as there are categories, they are all so said “with reference to one thing and one nature” (Γ 2 1003<sup>a</sup>33–34)—substance. It could still be the case, of course, that the cosmos is episodic like a bad tragedy, made up of lots of separate substances having little ontologically to do with one another, but the number of episodes has at least been systematically reduced.

Before turning to the next phase in being’s unification, we need to look more closely at substance itself as it gets investigated and analyzed in Zeta, and then in Eta and Theta. The analysis begins with a *legomenon*—with something said and accepted quite widely.

Something is said to be (*legetai*) substance, if not in more ways, at any rate most of all in four. For the essence, the universal, and the genus seem to be the substance of each thing, and fourth of these, the underlying subject. (Z 3 1028<sup>b</sup>33–36)

Since “the primary underlying subject seems most of all to be substance” (1029<sup>a</sup>1–2), because what is said or predicated of it depends on it, the

investigation begins with this subject, quickly isolating three candidates: the matter, the compound of matter and form, and the form itself (1029<sup>a</sup>2–3), which is identical to the essence (Z 7 1032<sup>b</sup>1–2). Almost as quickly (Z 3 1029<sup>a</sup>7–32), the first two candidates are at least provisionally excluded, leaving form alone as the most promising candidate for being substance. But form is “most puzzling” (1029<sup>a</sup>33) and requires extraordinary ingenuity and resources to explore.

Aristotle begins the investigation into it with the most familiar and widely recognized case, which is the form or essence present in sublunary matter-form compounds. This investigation is announced in Z 3 1029<sup>b</sup>3–12, but not begun till some chapters later (Z 7 headnote) and not really completed till the end of Θ 5. By then the various other candidates for being substance have been eliminated or reconceived, and actuality and potentiality have come to prominence. Hence in Θ 6 it is with actuality or activity—*entelecheia* or *energeia* (H 2 1042<sup>b</sup>10n)—that form, and so substance, is identified, and matter with potentiality.

Precisely because actuality and potentiality are the ultimate explanatory factors, however, they themselves cannot be given an explanatory definition in yet more basic terms. Instead we must grasp them by means of an analogy:

What we wish to say is clear from the particular cases by induction, and we must not look for a definition of everything, but be able to comprehend the analogy, namely, that as what is building is in relation to what is capable of building, and what is awake is in relation to what is asleep, and what is seeing is in relation to what has its eyes closed but has sight, and what has been shaped out of the matter is in relation to the matter, and what has been finished off is to the unfinished. Of the difference exemplified in this analogy let the activity be marked off by the first part, the potentiality by the second. (Θ 6 1048<sup>a</sup>35–<sup>b</sup>6)

What is common, then, to matter-form compounds, mathematical objects, and divine substances is actuality. In the case of matter-form compounds and numbers the actuality is accompanied by potentiality—perceptual sublunary matter in the first case, intelligible matter in the second. In the case of divine substances and other such unmoved movers, it is not. They are “pure” activities or actualities, wholly actual at each moment. Matter-form compounds, by contrast, are never wholly actual—they are always in some way potential. You are actively reading this now, not actively swimming, but you could be swimming, since you have the presently un-activated capacity (or potentiality) to swim.

The science of being qua being can legitimately focus on form, or actuality, as the factor common to divine substances, matter-form compounds, and mathematical objects. But unless it can be shown that there is some explanatory connection between the forms in these different beings the non-episodic nature of being itself will still not have been established, and the pictures given to us by the natural, mathematical, and theological sciences will, so to speak, be separate pictures, and the being they collectively portray will be divided.

The next stage in the unification of being and the legitimation of the science dealing with it qua being is effected by an argument that trades, unsurprisingly, on the identification of form and matter with actuality and potentiality. Part of the argument is given in  $\Theta$  8–9, where the various sorts of priority requisite in a substance are argued to belong to actuality rather than potentiality. But it is in  $\Lambda$  6 that the pertinent consequences are most decisively drawn:

If there is something that is capable of moving things or acting on them, but that is not actively doing so, there will not [necessarily] be movement, since it is possible for what has a capacity not to activate it. There is no benefit, therefore, in positing eternal substances, as those who accept the Forms do, unless there is to be present in them some starting-point that is capable of causing change. Moreover, even this is not enough, and neither is another substance beyond the Forms. For if it will not be active, there will not be movement. Further, even if it will be active, it is not enough, if the substance of it is a capacity. For then there will not be *eternal* movement, since what is potentially may possibly not be. There must, therefore, be such a starting-point, the very substance of which is activity. Further, accordingly, these substances must be without matter. For they must be eternal, if indeed *anything* else is eternal. Therefore they must be activity. (1071<sup>b</sup>12–22)

Matter-form compounds are, as such, capable of movement and change. The canonical examples of them—perhaps the only genuine or fully fledged ones—are living metabolizing beings ( $Z$  17 1041<sup>b</sup>29–30). But if these beings are to be actual, there must be substances whose very essence is activity—substances that do not need to be activated by something else.

With matter-form compounds shown to be dependent on substantial activities for their actual being, a further element of vertical unification is introduced into beings, since layer-wise the two sorts of substances belong together. Laterally, though, disunity continues to threaten. For as

yet nothing has been done to exclude the possibility that each compound substance has a distinct substantial activity as its own unique activator. Being, in that case, would be a set of ordered pairs, the first member of which was a substantial activity, the second a matter-form compound, with all its dependent attributes.

In A 8 Aristotle initially takes a step in the direction of such a bipartite picture. He asks how many substantial activities are required to explain astronomical phenomena, such as the movements of the stars and planets, and answers that there must be forty-nine of them (1074<sup>a</sup>16n). But these forty-nine are visibly coordinated with each other so as to form a system. And what enables them to do so, and constitute a single heaven, is that there is a single prime mover of all of them:

It is evident that there is but one heaven. For if there are many, as there are many humans, the starting-point for each will be one in form but in number many. But all things that are many in number have matter, for one and the same account applies to many, for example, humans, whereas Socrates is one. But the primary essence does not have matter, since it is an actuality. The primary immovable mover, therefore, is one both in account and in number. And so, therefore, is what is moved always and continuously. Therefore, there is only one heaven. (1074<sup>a</sup>31–38)

The argument is puzzling, to be sure, since the immateriality that ensures the uniqueness of the prime mover would seem to threaten the multiplicity of the forty-nine movers, since they are also immaterial (discussed in 1074<sup>a</sup>31n); nonetheless the point of it is clear enough: what accounts for the unity of the heaven is that the movements in it are traceable back to a single cause—the prime mover.

It is tempting to follow in Aristotle's footsteps at this point and discuss the nature of the prime mover—how he moves the primary heaven in the way, familiar from Dante, that an unmoved object of love or desire moves an animate being, so that the primary heaven and the others as well must all be animate beings in order to be so moved, and why it is that he must be a cosmic understanding that has that understanding itself as its sole object. But it is better for present purposes to stick to our topic and look at the next phase in the unification of beings, in which the sublunary world is integrated with the already unified superlunary one studied by astronomy.

This takes place in A 10, although elements of it have emerged earlier. One obvious indication of this unification is the dependence of the reproductive cycles of plants and animals on the seasons, and their dependence, in turn, on the movements of the sun and moon:



The cause of a human is both his elements, fire and earth as matter and the special form [as form], and furthermore some other external thing, such as the father, and beyond these the sun and its movement in an inclined circle. (1071<sup>a</sup>13–16)

And beyond even that there is the unity of the natural world itself, which is manifested in the ways in which its inhabitants are adapted to each other:

All things are jointly ordered in a way, although not in the same way—even swimming creatures, flying creatures, and plants. And the order is not such that one thing has no relation to another but rather there is a relation. For all things are jointly ordered in relation to one thing—but it is as in a household, where the free people least of all do things at random, but all or most of the things they do are ordered, while the slaves and beasts can do a little for the common thing, but mostly do things at random. For this is the sort of starting-point that the nature is of each of them. I mean, for example, that all must at least come to be disaggregated [into their elements]; and similarly there are other things which they all share for [the good of] the whole. (A 10 1075<sup>a</sup>16–25)

Just how much unity all this results in—just what it means to speak of “the nature of the whole” (1075<sup>a</sup>11) or of the universe as having “one ruler” (1076<sup>a</sup>4)—is a matter of dispute. The fact remains, though, that the sublunary realm is sufficiently integrated with the superlunary one that we can speak of them as jointly having a nature and a ruler and as being analogous not to Heraclitus’ “heap of random sweepings,” but to an army (1075<sup>a</sup>13) and a household (1075<sup>a</sup>22n).

We may agree, then, that the divine substances in the superlunary realm and the compound substances in the sublunary one have *prima facie* been vertically integrated into a single explanatory system. When we look at the form of a sublunary matter-form compound, then, we will find in it the mark of a superlunary activator, just as we do in the case of the various heavenly bodies, and, as in the line of its efficient causes, we find “the sun and its movement in an inclined circle” (A 7 1071<sup>a</sup>15–16). Still awaiting integration, though, are the mathematical objects, and their next of kin, Platonic Forms.

That there is mathematical structure present in the universe can seem to be especially clear in the case of the superlunary realm, just as mathematics itself, with its rigorous proofs and necessary and certain truths, can seem the very paradigm of scientific knowledge. So it is hardly surprising that some of Aristotle’s predecessors, especially Pythagoreans and Platonists,

thought that the primary causes and starting-points of beings are to be found in the part of reality that is mathematics friendly, or in some way mathematizable. For example, some Platonists (Plato among them, in Aristotle's much disputed view) held that for each kind of sublunary (or perceptible) thing there was an eternal intelligible Form or Idea to which it owed its being, and which owed its own being, in turn, to "the one," as its substance, and the so-called indefinite dyad of the great and the small, as its matter. So when we ask what makes a man a man, the answer will be, because it participates in the Form or Idea of a man, which owes its being to the way it is constructed or generated from the indefinite dyad and the one. And because the Forms are so constructed, Aristotle says (anyway on one reading of the text) that "the Forms are the numbers" (A 6 987<sup>b</sup>20–22). Between these so-called Form (or Ideal) numbers, in addition, are the numbers that are the objects of mathematics: the intermediates. This elaborate system of, as I put it, mathematics-friendly objects, then, are the substances—the ultimate starting-points and causes of beings qua beings.

Against these objects and the ontological role assigned to them, Aristotle launches a host of arguments (thirty-two or so in A 9, twenty-four in M 8–9, and many others elsewhere), proposing in their place an entirely different account of mathematical objects, which treats them not as substantial starting-points and causes but as abstractions from perceptible sublunary beings—dependent entities, in other words, rather than self-subsistent or intrinsic ones (M 2–3). This completes the vertical and horizontal unification of being: attributes depend on substances, substantial matter-form compounds depend on substantial forms, or activities, numbers depend on substances.

Beings are not said to be "in accord with one thing," then, as they would be if they formed a single genus, but "with reference to one thing"—namely, a divine substance that is in essence an activity. And it is this more complexity, compatible with generic diversity, and a genuine multiplicity of distinct genus-specific sciences, but just as robust and well grounded as the simpler genus-based sort of unity, that grounds and legitimates the science of being qua being as a single science dealing with a genuine object of study (I 2 1003<sup>b</sup>11–16). The long argument that leads to this conclusion is thus a sort of existence proof of the science on which the *Metaphysics* focuses.

It is the priority of a divine substance with that science as its science that justifies each of the following descriptions of what the *Metaphysics* is about:

If, then, there is no other substance beyond those composed by nature, natural science will be the primary science. But if there is some immovable substance, this [that is, theological philosophy] will be prior and will be primary philosophy, and it will be universal in this way, namely, because it is primary. And it

will belong to it to get a theoretical grasp on being qua being, both what it is and the things that belong to it qua being. (E 1 1026<sup>a</sup>27–32)

Whether there is, beyond the matter of these sorts of substances, another sort of matter, and whether to look for another sort of substance, such as numbers or something of this sort, must be investigated later. For it is for the sake of this that we are trying to make some determinations about the perceptible substances, since in a certain way it is the function of natural science and secondary philosophy to have theoretical knowledge about the perceptible substances. (Z 11 1037<sup>a</sup>10–16)

Since we have spoken about the capacity [or potentiality] that is said [of things] with reference to movement, let us make some distinctions concerning activity, both concerning what it is and what sort of thing it is. For the capable too will at the same time become clear as we make our determinations, because we do not say only of that which naturally moves something else, or is moved by something else, that it is capable, whether unconditionally or in a certain way, but also use the term in a different way, which is why in the course of our inquiry we went through the former. (Θ 6 1048<sup>a</sup>25–30)

Concerning the primary starting-points and the primary causes and elements, however, some of what is said by those who speak only about perceptible substance has been discussed in our works on nature, while some does not belong to the present methodical inquiry. But what is said by those who assert that there are other substances beyond the perceptible ones is something we need to get a theoretical grasp on next after what we have just discussed. (M 9 1086<sup>a</sup>21–26)

The science of being qua being is a sort of theology, as A 2 already told us it was, but it is a sort of theology only because of the special role of the primary god among beings.

### *Is the Investigation in the Metaphysics a Scientific One?*

If we think of a science in the exact sense as consisting exclusively of what is demonstrable, as we saw Aristotle himself sometimes does, we will be

right to conclude that a treatise without demonstrations in it cannot be scientific. But if, as he also does, we include knowledge of starting-points as parts of science, we will not be right, since a treatise could contribute to a science not by demonstrating anything but by arguing to the starting-points themselves—an enterprise which couldn't without circularity consist of demonstrations *from* those starting-points. Arguments leading from starting-points and arguments leading to starting-points are different, we are invited not to forget (NE I 4 1095<sup>a</sup>30–32), just as we are told that because establishing starting-points is “more than half the whole” (I 7 1098<sup>b</sup>7), we should “make very serious efforts to define them correctly” (1098<sup>b</sup>5–6). We might reasonably infer, therefore, that the *Metaphysics* is a contribution to the *science of being qua being* precisely because it contributes to the correct definition and secure grasp on starting-points without which no science can exist.

In our investigation of starting-points, “we must,” Aristotle says, “start from things known to us” (NE I 4 1095<sup>b</sup>3–4). For the sake of clarity, let us call these *raw starting-points*. These are the ones we start from when we are arguing to *explanatory scientific starting-points*. It is important not to confuse the two—especially when, as in the *Metaphysics*, the raw starting-points are in part the result of the sort of meta-level induction carried out on the various special sciences we looked at earlier and in part the result of a critical investigation of the views of other philosophers on the nature of the starting-points of such sciences (as in, for example, A 3–10).

In the case of the special sciences the explanatory starting-points include, in particular, definitions that specify the genus and differentiae of the real (as opposed to nominal) universal essences of the beings with which the science deals (APo. II 10 93<sup>b</sup>29–94<sup>a</sup>19). Since scientific definitions must be apt starting-points of demonstrations, this implies, Aristotle thinks, that the “extremes and the middle terms must come from the same genus” (I 7 75<sup>b</sup>10–11). As a result a single canonical science must deal with a single genus (I 28 87<sup>a</sup>38–39). To reach these definitions from raw starting-points, we first have to have the raw starting-points ready to hand. Aristotle is clear about this, as he is indeed about what is supposed to happen next:

The method (*hodos*) is the same in all cases, in philosophy as well as in the crafts or any sort of learning whatsoever. For one must observe for both terms what belongs to them and what they belong to, and be supplied with as many of these terms as possible, and one must investigate them by means of the three terms [in a syllogism], in one way when refuting, in another way when establishing something. When it is in accord with truth, it must be from the terms that are catalogued (*diagegramenón*)

as truly belonging, but in dialectical deductions it must be from premises that are in accord with [reputable] belief. . . . Most of the starting-points, however, are special to each science. That is why experience must provide us with the starting-points where each is concerned—I mean, for example, that experience in astronomy must do so in the case of astronomical science. For when the appearances had been adequately grasped, the demonstrations in astronomy were found in the way we described. And it is the same way where any other craft or science whatsoever is concerned. Hence if what belongs to each thing has been grasped, at that point we can readily exhibit the demonstrations. For if nothing that truly belongs to the relevant things has been omitted from the collection, then concerning everything, if a demonstration of it exists we will be able to find it and give the demonstration, and if it is by nature indemonstrable, we will be able to make that evident. (*APr.* I 30 46<sup>a</sup>3–27)

Once we have a catalogue of the *raw starting-points*, then, the demonstrative explanation of them from explanatory scientific starting-points is supposedly fairly routine. We should not, however, demand “the cause [or explanation] in all cases alike. Rather, in some it will be adequate if the fact that they are so has been correctly shown (*deiknunaî*) as it is indeed where starting-points are concerned” (*NE* I 8 1098<sup>a</sup>33–<sup>b</sup>2). But what exactly is it to show a starting-point correctly or adequately?

Aristotle describes the science of being qua being as a branch (ultimately the theological one) of theoretical philosophy (*E* I 1026<sup>a</sup>18–19, 30–32) or theoretical science (*K* 7 1064<sup>b</sup>1–3), and to the explanatory scientific starting-points of philosophical sciences, he claims, there is a unique route:

Dialectic is useful in the philosophical sciences because the capacity to go through the puzzles on both sides of a question will make it easier to discern what is true and what is false in each. Furthermore, dialectic is useful in relation to the primary [starting-points] (*ta prota*) in each science. For it is impossible to say anything about these based on the starting-points properly belonging to the science in question, since these starting-points are, of all of them, the primary ones, and it is through reputable beliefs (*endoxa*) about each that it is necessary to discuss them. This, though, is a task special to, or most characteristic of, dialectic. For because of its ability to examine (*exetastikê*), it has a route toward the starting-points of all methodical inquiries. (*Top.* I 2 101<sup>a</sup>34–<sup>b</sup>4)

Prima facie, then, the *Metaphysics* should correctly show the explanatory starting-points of the science of being qua being by going through puzzles and solving these by appeal to reputable beliefs. But before we rush to the *Metaphysics* to see whether that is what we do find, we need to be clearer about what exactly we should be looking for.

Dialectic is recognizably a descendant of the Socratic elenchus, which famously begins with a question like this: *Ti esti to kalon?* What is the noble? The respondent, sometimes after a bit of nudging, comes up with a universal definition, what is noble is what all the gods love, or whatever it might be (I adapt a well-known answer from Plato's *Euthyphro*). Socrates then puts this definition to the test by drawing attention to some things that seem true to the respondent himself but which conflict with his definition. The puzzle or *aporia* that results from this conflict then remains for the respondent to try to solve, usually by reformulating or rejecting his definition. Aristotle understood this process in terms that show its relationship to his own:

Socrates, on the other hand, busied himself about the virtues of character, and in connection with them was the first to inquire about universal definition. . . . It was reasonable, though, that Socrates was inquiring into the what-it-is. For he was inquiring in order to deduce, and the what-it-is is a starting-point of deductions. For at that time there was not yet the strength in dialectic that enables people, and separately from the what-it-is, to investigate contraries, and whether the same science is a science of contraries. For there are two things that may be fairly ascribed to Socrates—inductive arguments and universal definition, both of which are concerned with a starting-point of scientific knowledge. (M 4 1078<sup>b</sup>17–30; also A 6 987<sup>b</sup>1–4)

In Plato too dialectic is primarily concerned with scientific starting-points, such as those of mathematics, and seems to consist in some sort of elenchus-like process of reformulating definitions in the face of conflicting evidence so as to render them puzzle-free (*Rep.* VII 532a1–533d1). Aristotle can reasonably be seen, then, as continuing a line of thought about dialectic, while contributing greatly to its exploration, systemization, and elaboration in works such as *Topics* and *Sophistical Refutations*.

Consider now the respondent's first answer, his first definition: what is noble is what the gods love. Although it is soon shown to be incorrect, there is something quite remarkable about its very existence. Through experience shaped by acculturation and habituation involving the learning of a natural language the respondent is confident that he can say what

nobility is. He has learned to apply the word "noble" to particular people, actions, and so on correctly enough to pass muster as knowing its meaning, knowing how to use it. From these particular cases he has reached a putative universal, something the particular cases have in common. But when he tries to define that universal in words, he gets it wrong, as Socrates shows. Here is Aristotle registering the significance of this: "The things that are knowable and primary for particular groups of people are often only slightly knowable and have little or nothing of the being in them. Nonetheless, beginning from things that are poorly known but known to ourselves, we must try to know the ones that are wholly knowable, proceeding, as has just been said, through the former" (Z 3 1029<sup>b</sup>8–12).

The route by which the respondent reaches the universal that he is unable to define correctly is what Aristotle calls induction (*epagôgê*). This begins with (1) perception of particulars, which leads to (2) retention of perceptual contents in memory, and, when many such contents have been retained, to (3) an experience, so that for the first time "there is a universal in the soul" (*APo.* II 19 100<sup>a</sup>3–16). The universal reached at stage (3), which is the one the respondent reaches, is described as "indefinite" and "better known by perception" (*Ph.* I 1 184<sup>a</sup>22–25). It is the sort of universal, often quite complex, that constitutes a nominal essence corresponding to the nominal definition or meaning of a general term. Finally, (4) from experience come craft knowledge and scientific knowledge, when "from many intelligible objects belonging to experience, one universal supposition about similar things comes about" (*A* 1 981<sup>a</sup>5–7).

The nominal (or analytic, meaning-based) definition of the general term "thunder," for example, might pick out the universal *loud noise in the clouds*. When science investigates the things that have this nominal essence, it may find that they also have a real essence or nature in terms of which their other features can be scientifically explained:

Since a definition is said to be an account of what something is, it is evident that one sort will be an account of what its name, or some other name-like account, signifies—for example, what triangle signifies. . . . Another sort of definition is an account that makes clear why it exists. So the former sort signifies something but does not show it, whereas the latter will evidently be like a demonstration of what it is, differing in arrangement from a demonstration. For there is a difference between saying why it thunders and saying what thunder is. In the first case you will say: because fire is being extinguished in the clouds. And what is thunder? The loud noise of fire being extinguished in the clouds. Hence the same account is given in different

ways. In one way it is a continuous demonstration, in the other a definition. Further, a definition of thunder is a noise in the clouds, and this is a conclusion of the demonstration of what it is. The definition of an immediate item, though, is an indemonstrable positing (*thesis*) of what it is. (*APo.* II 10 93<sup>b</sup>29–94<sup>a</sup>10; compare *DA* II 2 413<sup>a</sup>13–20, *Z* 17)

A real (or synthetic, fact-based) definition that analyzes this real essence into its “elements and starting-points” (*Ph.* I 1 184<sup>a</sup>23), which will be definable but indemonstrable within the science, makes intrinsically clear what the nominal definition made clear only to us by enabling us to recognize instances of thunder in a fairly—but imperfectly—reliable way. As a result, thunder itself, now clearly a natural and not just a conventional kind, becomes better known not just to us but entirely or unconditionally. These analyzed universals, which are the sort reached at stage (4), are the ones suited to serve as starting-points of the sciences and crafts: “experienced people know the that but do not know the why, whereas craftsmen know the why, that is, the cause” (*A* 1 981<sup>a</sup>28–30).

Socrates too, we see, wanted definitions that were not just empirically adequate but also explanatory: in telling Euthyphro what he wants in the case of piety, he says that he is seeking “the Form itself *in virtue of which* all the pieties are pieties” (*Euthphr.* 6d10–11). That is why he rejects the definition of piety as being what all the gods love. This definition is in one way correct, presumably, in that if something is pious it is necessarily loved by the gods and vice versa, but it isn’t explanatory, since it doesn’t tell us what it is about pious things that makes all the gods love them, and so does not identify the form in virtue of which they are pious (9e–11b).

Let us go back. We wanted to know what was involved in showing a scientific starting-point. We were told how we could *not* do this, namely, by demonstrating it from scientific starting-points. Next we learned that dialectic had a route to it from reputable beliefs. At the same time, we were told that induction had a route to it as well—something the *Nicomachean Ethics* also tells us: “we get a theoretical grasp on some starting-points through induction, some through perception, some through some sort of habituation, and others through other means” (*I* 7 1098<sup>b</sup>3–4). This suggests that induction and dialectic are in some way or other the same process.

What shows a Socratic respondent to be wrong is an example that his definition does not fit. The presentation of the example might be quite indirect, however. It might take quite a bit of stage setting, elicited by the asking of many questions, to bring out a puzzle. But if it does succeed in doing so, it shows that the universal grasped by the respondent and the definition of



it produced by him are not entirely or unconditionally knowable and that his state is not one of clear-eyed understanding:

A puzzle in thought makes manifest a knot in the subject matter. For insofar as thought is puzzled it is like people who are tied up, since in both cases it is impossible to move forward. That is why we must get a theoretical grasp on all the difficulties beforehand, both for these reasons and because those who inquire without first going through the puzzles are like people who do not know where they have to go. And, in addition, a person [who has not already grasped the puzzles] does not even know whether he has found what he is inquiring into. For to someone like that the end is not clear, whereas to a person who has already grasped the puzzles it is clear. (a 1 995<sup>30</sup>-<sup>b2</sup>)

But lack of such clear-eyed understanding of a scientific starting-point has serious downstream consequences:

If we are to have scientific knowledge through demonstration, . . . we must know the starting-points better and be better convinced of them than of what is being shown, but we must also not find anything more convincing or better known among things opposed to the starting-points from which a contrary mistaken conclusion may be deduced, since someone who has unconditional scientific knowledge must be incapable of being convinced out of it. (APo. I 2 72<sup>37</sup>-<sup>b4</sup>)

If dialectical examination brings to light a puzzle in a respondent's thought about a scientific starting-point, then he cannot have any unconditional scientific knowledge even of what he may well be able to demonstrate correctly from it. Contrariwise, if dialectical examination brings to light no such puzzle, he apparently does have clear-eyed understanding, and his route to what he can demonstrate is free of obstacles.

At the heart of dialectic, as Aristotle understands it, is the dialectical deduction (*dialektikos sullogismos*). This is the argument lying behind the questioner's questions, partly dictating their order and content and partly determining the strategy of his examination. In the following passage it is defined and contrasted with two relevant others:

Dialectical arguments are those that deduce from reputable beliefs in a way that reaches a contradiction; peirastic arguments are those that deduce from those beliefs of the respondent that

anyone must know (*eidenai*) who pretends to possess scientific knowledge . . . ; contentious (*eristikos*) arguments are those that deduce or appear to deduce from what appear to be reputable beliefs but are not really such. (*SE* 2 165<sup>b</sup>3–8)

If we think of dialectical deductions in this way, a dialectician, in contrast to a contender, is an honest questioner, appealing to genuinely reputable beliefs and employing valid deductions. “Contenders and sophists use the same arguments,” Aristotle says, “but not to achieve the same goal. . . . If the goal is apparent victory, the argument is contentious; if it is apparent wisdom, sophistic” (11 171<sup>b</sup>27–29). Nonetheless, he does also use the term *dialektikē* as the name for the craft that honest dialecticians and sophists both use: “In dialectic a sophist is so called in virtue of his deliberate choice, and a dialectician is so called not in virtue of his deliberate choice, but in virtue of the capacity he has” (*Rh.* I 1 1355<sup>b</sup>20–21). If dialectic is understood in this way, a dialectician who deliberately chooses to employ contentious arguments is a sophist (I 1 1355<sup>a</sup>24–<sup>b</sup>7). We need to be careful, therefore, to distinguish *honest dialectic* from what we may call *plain dialectic*, which—like all crafts—can be used for good or ill (*NE* V 1 1129<sup>a</sup>13–17).

The canonical occasion for the practice of the Socratic elenchus, obviously, is the examination of someone else. But there is nothing to prevent a person from practicing it on himself: “How could you think,” Socrates ask Critias, “that I would refute you for any reason other than the one for which I would refute myself, fearing lest I might inadvertently think I know something when I don’t know it?” (*Chrm.* 166c7–d2). Dialectic is no different in this regard:

The premises of the philosopher’s deductions, or those of a person who is investigating by himself, though true and knowable, may be refused by the respondent because they lie too near to the original proposition, and so he sees what will happen if he grants them. But the philosopher is unconcerned about this. Indeed, he will presumably be eager that his axioms should be as familiar and as near to the question at hand as possible, since it is from premises of this sort that scientific deductions proceed. (*Top.* VIII 1 155<sup>b</sup>10–16)

What we are to imagine, then, is that the philosopher surveys the raw scientific starting-points, constructing detailed catalogues of these. He then tries to formulate definitions of the various universals involved in them that seem to be candidate scientific starting-points, testing these against the raw scientific starting-points by trying to construct demonstrations

from them. But these definitions will often be no more than partial: the philosopher is only on his way to complete definitional starting-points, just as the demonstrations will often be no more than proto- or nascent demonstrations. The often rudimentary demonstrations that we find in Aristotle's scientific treatises are surely parts of this process of arguing *to* not *from* starting-points. We argue to these in part by seeing whether or to what extent we could demonstrate from them.

So: First, we have the important distinction between dialectic proper, which includes the use of what appear to be deductions from what appear to be reputable beliefs, and honest dialectic, which uses only genuine deductions from genuine reputable beliefs. Second, we have the equally important distinction between the use of dialectic in examining a potentially hostile respondent and its use by the philosopher in a perhaps private pursuit of the truth. Third, we have an important contrast between honest dialectical premises and philosophical ones or scientific ones: honest dialectical premises are reputable beliefs, philosophical and scientific premises must be true and knowable. Fourth, we have two apparently equivalent routes to scientific starting-points, one inductive, which starts from *raw starting-points*, and the other dialectic, which starts from reputable beliefs.

According to the official definition, reputable beliefs are "things that are believed by everyone, by the majority, or by the wise—either by all of them, or by most, or by the most well known and most reputable" (*Top.* I 1 100<sup>b</sup>21–23). Just as the scientist should have a catalogue of scientific truths ready to hand from which to select the premises of his demonstrations, so a dialectician ought also to select premises "from arguments that have been written down and produce catalogues (*diagraphas*) of them concerning each kind of subject, putting them under separate headings—for example, 'Concerned with good,' 'Concerned with life'" (I 14 105<sup>b</sup>12–15).

Clearly, then, there will be considerable overlap between the scientist's catalogue of raw starting-points and the honest dialectician's catalogue of reputable beliefs. For, first, things that are believed by reputably wise people are themselves reputable beliefs, and, second, any respondent would accept "the beliefs of those who have investigated the subjects in question—for example, on a question of medicine he will agree with a doctor, and on a question of geometry with a geometer" (*Top.* I 10 104<sup>a</sup>8–37). The catalogues also differ, however, in that not all reputable beliefs need be true. If a proposition is a reputable belief, if it would be accepted by all or most people, it is everything an honest dialectician could ask for in a premise, since his goal is simply this: to show by honest deductions that a definition offered by any respondent whatsoever conflicts—if it does—with other beliefs the respondent has. That is why having a complete or fairly complete catalogue of reputable beliefs is such an important resource for a dialectician. It is

because dialectic deals with things only "in relation to belief," then, and not as philosophy and science do, "in relation to truth" (I 14 105<sup>b</sup>30–31) that it needs nothing more than reputable *beliefs*.

Nonetheless, the fact that all or most people believe something leads us "to trust it as something in accord with experience" (*Div. Somn.* 1 426<sup>b</sup>14–16), and—since human beings "are naturally adequate as regards the truth and for the most part happen upon it" (*Rh.* I 1 1355<sup>a</sup>15–17)—as containing some truth. That is why having catalogued some of the things that people believe happiness to be, Aristotle writes: "Some of these views are held by many and are of long standing, while others are held by a few reputable men. And it is not reasonable to suppose that either group is entirely wrong, but rather that they are right on one point at least or even on most of them" (*NE* 1 8 1098<sup>b</sup>27–29). Later he generalizes the claim: "things that seem to be so to everyone, these, we say, *are*" (*X* 2 1172<sup>b</sup>36–1173<sup>a</sup>1). Raw starting-points are just that—raw. But when refined some shred of truth is likely to be found in them. So likely, indeed, that if none is found, this will itself be a surprising fact needing to be explained: "when a reasonable explanation is given of why an untrue view appears true, this makes us more convinced of the true view" (*VII* 14 1154<sup>a</sup>24–25). It is the grain of truth enclosed in a reputable belief that a philosopher or scientist is interested in, then, not in the general acceptability of the surrounding husk, much of which he may discard.

The process of refinement in the case of a candidate explanatory starting-point is that of testing a definition of it against reputable beliefs. This may result in the definition being accepted as it stands or in its being altered or modified. The same process applies to the reputable beliefs themselves, since they may conflict not only with the definition but also with each other. Again, this may result in their being modified, often by uncovering ambiguities within them or in the argument supporting them, or by drawing distinctions that uncover complexities in these, or they may be rejected entirely, provided that their appearance of truth is explained away.

The canonical occasion for the use of honest dialectic, as of the Socratic elenchus and plain dialectic, is the examination of a respondent. The relevant premises for the questioner to use, therefore, are the reputable beliefs in his catalogue that his respondent will accept. Just how wide this set of beliefs is in a given case depends naturally on how accessible to untrained respondents the subject matter is on which he is being examined. We may all have some beliefs about thunder and other phenomena readily perceptible to everyone, which are—for that very reason—reputable. But about fundamental explanatory notions in an esoteric science we may have none at all.

When a scientist is investigating by himself the class of premises he will select from is the catalogue of *all* the raw starting-points of his science, despite a natural human inclination to do otherwise:

Yet . . . people seem to inquire up to a certain point, but not as far as it is possible to take the puzzle. It is what we are all inclined to do, to make our inquiry not with an eye to the thing itself but with an eye to the person who says things that contradict him. For even a person inquiring on his own continues up to the point at which he is no longer able to contradict himself. That is why a person who is going to inquire correctly should be able to raise objections to a position by using objections that are special to the relevant genus, and this will be when he has acquired a theoretical grasp on all the differentiae. (*Cael.* II 13 294<sup>b</sup>6–13)

Hence a scientist will want to err on the side of excess, adding any reputable belief that appears to have any relevance whatsoever to his catalogue. When he formulates definitions of candidate scientific starting-points from which he thinks he can demonstrate the raw ones, he must then examine himself to see whether he really does have the scientific knowledge of it that he thinks he does. If he is investigating together with fellow scientists, others may examine him: we all do better with the aid of co-workers (*NE* X 7 1177<sup>a</sup>34). What he is doing is using honest dialectic on himself or having it used on him. But this, we see, is little different from the final stage—stage (4)—of the induction we looked at earlier. Induction, as we might put it, is in its final stage (possibly self-directed) honest dialectic.

In a famous and much debated passage, Aristotle writes:

We must, as in the other cases, set out the things that appear to be so, and first go through the puzzles, and, in that way, show preferably all the reputable beliefs about these ways of being affected, or, if not all of them, then most of them and the ones with the most authority. For if the objections are resolved and the reputable beliefs are left standing, that would be an adequate showing. (*NE* VII 1 1145<sup>b</sup>2–7)

The specific topic of the comment is “these ways of being affected,” which are self-control and its lack as well as resilience and softness. Some people think that it applies only to this topic and should not be generalized, even though “as in the other cases” surely suggests a wider scope. And, as we can now see that scope is in fact entirely general, since it describes the honest

dialectical or inductive route to the starting-points of *all* the sciences and methods of inquiry, with *tithenai ta phainomena* ("setting out the things that appear to be so") describing the initial phase in which the raw starting-points are collected and catalogued.

Now that we know what it means for honest dialectic of the sort employed by the philosopher to provide a route to the explanatory starting-points of the philosophical sciences, we are in a position to see that it is precisely such a route that the *Metaphysics* takes to those of the science of being qua being. Since this route is the sort any science must take to prove its explanatory starting-points, the investigation undertaken in the *Metaphysics* is a scientific one. It is not, to be sure, a demonstration from the starting-points of being qua being, but rather a showing of the starting-points themselves, which, if successful, allows us to achieve the sort of puzzle-free grasp on them that the primary god, without having to work through any of the puzzles that muddy our vision, has on the starting-point of everything—himself.

The scientific starting-points we have been discussing are those that, because they are special to a specific first-order science, are grounded in the first-order genus with which it deals. These are the ones that, because they are analogous to those of other first-order sciences, have more general higher-order versions grounded in higher-order genera, or categories. But there are other sorts of scientific starting-points, such as the Principle of Non-contradiction and other starting-points of demonstration, that all first-order sciences directly use, but that, precisely because they are not grounded in a first-order genus, none deals with (B 3 996<sup>b</sup>26–997<sup>a</sup>11). Similarly, there are the various attributes that hold of all beings qua beings, rather than qua being members of a first-order genus, such as "prior and posterior, genus and species, whole and part, and others of this sort" (Γ 2 1005<sup>a</sup>15–18). Each of these, too, must be defined by the science of being qua being in a way that resolves the puzzles to which they give rise. This work is largely of the sort that we would classify as conceptual and think of as *a priori*—*logikós* as Aristotle might say (Z 4 1029<sup>b</sup>13n). But this should not distract us from the fact that its results must be grounded not in concepts but, like those of mathematics, which has the same *a priori* look, in empirical reality—in being itself considered qua being.

## *The Audience for the Metaphysics*

In the *Nicomachean Ethics*, Aristotle famously tells us that it is not a work for young or immature people, inexperienced in the practical matters with which it deals:

But each person correctly discerns the things he knows and is a good discerner of these. Hence a person well educated in a given area is a good discerner *in that area*, while a person well educated in all areas is an unconditionally good discerner. That is why a young person is not a suitable audience for politics. For he has no experience of the actions of life, and the accounts are in accord with these and concerned with these. (NE I 3 1094<sup>b</sup>25–1095<sup>a</sup>4)

It is less often recognized that he issues a similar warning in the *Metaphysics*, and that here, as in the *Ethics*, he makes being well educated a prerequisite:

That is why we should already have been well educated in what way to accept each argument, since it is absurd to look for scientific knowledge and for the way characteristic of scientific knowledge at the same time—and it is not easy to get hold of either. Accordingly, we should not demand the argumentative exactness of mathematics in all cases but only in the case of things that include no matter. (α 3 995<sup>a</sup>12–16)

But whereas in the case of ethics and politics the relevant experience is practical, in metaphysics—or, rather, in the case of the science of being qua being—it is theoretical. There we need experience in life. Here we need experience in the sciences. And in both we need the sort of training in honest dialectic, as in logic and what we would call the philosophy of science, for which the treatises in the so-called *Organon* (*Categories*, *De Interpretatione*, *Prior* and *Posterior Analytics*, *Topics*, and *Sophistical Refutations*) might serve—or might once have served—as a textbook.

There is much in these treatises, as in others, then, that readers of the *Metaphysics* are supposed to know already. When it is simply information or arguments that are at issue, notes can provide what we need. But there is more to being well educated than being well informed; we must also be the intellectual equivalent of morally virtuous.

When dialectic has done its testing of the opposing sides of a puzzle, we hear in the *Topics*, it “only remains to make a correct choice of one of them” (VIII 14 163<sup>b</sup>11–12). And what enables us make such a choice is the “naturally good disposition (*euphuia*)” that enables people to “discern correctly what is best by a correct love or hatred of what is set before them” (163<sup>b</sup>15–16). The reference to “what is best” suggests that this disposition is the *euphuia* also referred to in the following passage:

His seeking of the end in question is not self-chosen, rather, we must be born possessed of a sort of sight by which to discern correctly and choose what is truly good, and a person in whom this by nature operates correctly is naturally well disposed (*euphuês*). For this is what is greatest and noblest and is not the sort of thing we can get from someone else or learn but the sort of thing whose condition at birth is the one in which it will later be possessed and, when it is naturally such as to be in a good and noble condition, will be the naturally good disposition (*euphuia*) in its complete and true form. (NE III 5 1114<sup>b</sup>5–12)

And that, in fact, is what the distinction between philosophy and sophistry, which uses all of plain dialectic's resources, might lead us to expect, since "philosophy differs from dialectic in the way its capacity is employed, and from sophistic in the life it deliberately chooses" (Γ 2 1004<sup>b</sup>23–25).

Now a deliberate choice of how to live is at bottom a choice of an ultimate end or target for our life: "everyone who can live in accord with his own deliberate choice should posit some target for living nobly, whether honor, reputation, wealth, or education, which he will look to in doing all his actions" (EE I 2 1214<sup>b</sup>6–9). And what "teaches *correct* belief" about this end or target, thereby insuring that the deliberate choice of it is correct, is "natural or habituated virtue of character" (NE VII 8 1151<sup>a</sup>18–19). It is this, we may infer, in which the naturally good disposition under discussion consists. Hence if we possess it, and it has been properly developed by a good upbringing and education, when we hear from ethics that the starting-point it posits as the correct target for a human life is "activity of the soul in accord with virtue, and if there are more virtues than one, in accord with the best and most complete" (I 7 1098<sup>a</sup>16–18), we will accept it as true, and so strive to clear away the puzzles in such a way as to sustain its truth. If we do not possess it, we will reject this starting-point, so that in our choice between the conflicting sides of these puzzles, we will go for the wrong ones: "the truth in practical matters must be discerned from the facts of our life, since these are what have the controlling vote. When we examine what has been previously said, then, it must be discerned by bringing it to bear on the facts of our life, and if it is in harmony with the facts, we should accept it, but if it clashes, we should suppose it mere words" (X 8 1179<sup>a</sup>17–22).

In the *Rhetoric*, we learn of an apparently different sort of good natural disposition which might seem from the company it keeps to be an exclusively intellectual trait: "good natural disposition, good memory, readiness to learn, quick-wittedness . . . are all productive of good things" (I 6 1362<sup>b</sup>24–25). When it comes to solving dialectical problems bearing on "truth and knowledge," we might conclude, such apparently intellectual



good natural disposition is all we need, even if, when it comes to those bearing on “pursuit and avoidance” (*Top.* I 11 104<sup>b</sup>1–2), we also need its apparently more ethical namesake. It would be a mistake, though, to rush to this conclusion. For the ultimate starting-point and cause that the *Metaphysics* finally uncovers, which is at once the active understanding of active understanding, the prime unmoved mover, and the primary god, is the ultimate cause and starting-point for beings qua beings—all of them. And that means that it is our ultimate starting-point and cause too.

When we look at our lives from the outside, so to speak, from the theoretical point of view, if the *Metaphysics* is right, we see something amazing, namely, that the heavenly bodies, those bright denizens of the starry heavens above, are living beings who, like us, are moved by a desire for the best good—for the primary god (Λ 7). When we view it from the inside, from that perspective from which “the truth in practical matters” can alone be discerned, the *Ethics* tells us that we will find that we are moved by the same thing—that as the good for the heavenly bodies consists in contemplating the primary god, so too does our happiness: “The activity of a god, superior as it is in blessedness, will be contemplative. And so the activity of humans, then, that is most akin to this will most bear the stamp of happiness” (*NE* X 8 1178<sup>b</sup>21–23). But Aristotle’s hand is tipped even within the *Metaphysics* itself:

[Active understanding rather than receptive understanding] seems to be the divine element that understanding possesses, and contemplation seems to be most pleasant and best. If, then, that good state [of activity], which we are sometimes in, the [primary] god is always in, that is a wonderful thing, and if to a higher degree, that is yet more wonderful. But that is his state. And life too certainly belongs to him. For the activity of understanding is life, and he is that activity; and his intrinsic activity is life that is best and eternal. We say, then, that the god is a living being that is eternal and best, so that living and a continuous and everlasting eternity belong to the god, since this is the god. (Λ 7 1072<sup>b</sup>22–30)

That is why “we should not, in accord with the makers of proverbs, ‘think human things, since you are human’ or ‘think mortal things, since you are mortal’ but rather we should as far as possible immortalize, and do everything to live in accord with the element in us that is most excellent” (*NE* X 7 1177<sup>b</sup>31–34), this being our understanding—our divine *nous*.

Aristotle arrives at this great synthesis of theory and practice, as we saw, on empirical grounds, by reflecting on, and drawing inductive conclusions

from, the various sciences, theoretical, practical, and productive, as they existed in his day. He is not doing “armchair” metaphysics, but rather drawing on his own vast knowledge of these sciences to reach a unified explanatory picture of being as such and our place in it as practical agents and theorizers. If we followed in his footsteps, drawing on *our* sciences, from theoretical physics to engineering, economics, and ethics, we would not reach his conclusions about the primary starting-points and causes of beings qua beings. If we are to be Aristotelians now it cannot be by parroting Aristotle’s theories. Instead, it must be by taking him as a paradigm of how we might be philosophers ourselves—a “paradigm in the heavens,” so to speak, “for anyone who wishes to look at it and to found himself on the basis of what he sees” (Plato, *Rep.* IX 592b1–2).

# *Metaphysics*

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# BOOK ALPHA (I)

## A 1

980\*21 All humans by nature desire to know.<sup>1</sup> An indication of this is our liking for the perceptual capacities.<sup>2</sup> For even apart from their utility, these are liked because of themselves—and most of all the one because of the eyes.<sup>3</sup> For it is not only in order to do an action, but even when we are not going to do anything whatsoever, that we choose sight over (one might almost say) all the others. The cause of this is that of all perceptual capacities it enables us to know most fully and makes clear many differences.<sup>4</sup>

25 By nature, animals are born possessed of perception.<sup>5</sup> In some of them, memory does not come about from this, but in others it does come about.<sup>6</sup> And because it does, they are more practically-wise and better at learning than those incapable of remembering.<sup>7</sup> Practically-wise, but outside the reach of teaching, are the ones that cannot hear sounds (for example, bees and whatever other kind (*genos*) of animal may be like them), whereas those that in addition to memory have this perceptual capacity can be taught.<sup>8</sup>

25 Now, the other animals live by appearances and memories, and have but a small share in experience, whereas humankind lives also by craft knowledge and rational calculations.<sup>9</sup> From memories experience comes about in humans, since many memories of the same thing finally bring about the capacity of one experience.<sup>10</sup> Indeed, experience seems pretty much similar to scientific knowledge and craft knowledge.<sup>11</sup> But scientific knowledge and craft knowledge come to humans *through* experience.<sup>12</sup> For “experience made craft,” as Polus says, “and lack of experience, luck.”<sup>13</sup>

5 Craft knowledge comes about when, from many intelligible objects belonging to experience, one universal supposition about similar things comes about.<sup>14</sup> For to have a supposition that when Callias was sick with this disease this treatment benefited him, and similarly with Socrates and many other particular cases, is a matter of experience.<sup>15</sup> But to suppose that it benefited *everyone* of a certain sort, marked off by a single form, suffering from a certain disease (for example, phlegm-filled or bilious people when burning with a fever), is a matter of craft.<sup>16</sup>

10 With a view to action, then, experience seems no different from craft knowledge—on the contrary, we even see experienced people

being more successful than those who have an account but are without experience.<sup>17</sup> The cause of this is that experience is knowledge of particulars, whereas craft knowledge is of universals, and actions and productions are all concerned with particulars.<sup>18</sup> For the doctor does not cure a *human*, except coincidentally, but Callias or Socrates or someone else spoken of in that way, who happens coincidentally to be a human.<sup>19</sup> If, then, someone without experience has the account and knows the universal, but does not know the particular included under it, he will often make an error in treatment, since it is the particular that admits of treatment.<sup>20</sup>

Nevertheless, we regard *knowledge* and *comprehension* as characteristic of craft rather than of experience, and take it that craftsmen are wiser than experienced people, on the supposition that in every case wisdom follows along rather with knowledge than with experience. This is because craftsmen know the cause, whereas experienced people do not.<sup>21</sup> For experienced people know the that but do not know the why, whereas craftsmen know the why, that is, the cause.<sup>22</sup>

It is also because of this that we consider the architectonic practitioners in each craft to be more estimable, to know in a yet more full sense, and to be wiser than the handicraftsmen, because they know the causes of the things they produce.<sup>23</sup> The handicraftsmen, by contrast, we consider to be like some sort of inanimate things that produce without knowing what they produce, in the way, for example, that fire burns. But whereas inanimate things produce each result by a sort of nature, the handicraftsmen do so by habit—the supposition being that architectonic craftsmen are wiser not in terms of being practically efficient, but in terms of having the account themselves and knowing the causes.<sup>24</sup> On the whole too an indication of the person who knows, as opposed to the person who does not know, is his capacity to teach.<sup>25</sup> That is why we think craft knowledge to be more like scientific knowledge than experience is, since craftsmen can teach, while experienced people cannot.

Furthermore, we do not think that any perceptual capacities whatsoever constitute wisdom, even though they are most in control, at any rate of the knowledge of particulars.<sup>26</sup> Still, they do not tell us the why of anything (for example, why fire is hot), but only that it is hot.

At first, then, anyone who discovered any sort of craft that went beyond the common perceptual capacities was quite likely wondered at by people, not only because there was something useful in his discoveries, but also because he was thought wise and superior to others. But as more crafts were discovered, some of which were related to necessities, others to passing the time, it is quite likely that the discoverers

of the latter were always thought to be wiser, because their sciences did not aim at utility.<sup>27</sup> Hence when all such crafts were already developed, the sciences that aim neither at pleasure nor at necessities were discovered, first in the places where people had leisure. That is why the mathematical crafts first arose in Egypt, since there the priestly class were allowed to be at leisure.<sup>28</sup>

We have said in the *Ethics* what the difference is between craft knowledge, scientific knowledge, and other things of the same kind (*genos*).<sup>29</sup> What our present account is for the sake of, however, is this: Everyone takes what is called "wisdom" to be concerned with the primary causes and the starting-points.<sup>30</sup> And so, as we said earlier, the person of experience seems wiser than those who have any perceptual capacity whatsoever, a craftsman than experienced people, an architectonic craftsman than a handicraftsman, and theoretical sciences than productive ones. So it is clear that theoretical wisdom is scientific knowledge of certain sorts of starting-points and causes.<sup>31</sup>

## A 2

Since this is the science we are inquiring into, this is what we should investigate, namely, what sorts of causes and what sorts of starting-points are the concern of the science that is theoretical wisdom. Well, if we were to get hold of the suppositions we have about the theoretically-wise person, perhaps the answer will thereby become more evident.<sup>32</sup>

First, then, we take it that [1] what a wise person has scientific knowledge about is *all things*, insofar as they admit of it, without his having particular scientific knowledge of them.<sup>33</sup> Next, we take it that [2] the person who has the capacity to know difficult things, that is, things that are not easy for humans to know—he is wise.<sup>34</sup> For perception is common to all, which is why it is easy and involves no wisdom. Further, we take it that someone is wiser in any science if [3] he is a more exact knower of it and [4] a better teacher of the causes.<sup>35</sup> Also, we take it that among the sciences [5] the one choiceworthy for the sake of itself, and for the knowing of it, is more theoretical wisdom than one choiceworthy for the sake of its results. Also, we take [6] a more ruling science to be wisdom more than a subordinate one. For a wise person should prescribe, not be prescribed to, and should be obeyed by the less wise, not obey someone else. Such, then, are the sort and number of suppositions we hold about theoretical wisdom and theoretically-wise people.

Of these, [Response 1] scientific knowledge of all things necessarily belongs to the person who most of all has universal scientific knowledge, since he in a way knows all the things that fall under it.<sup>36</sup> [R2] The most universal things of all, however, are pretty much the most difficult for humans to know, since they are furthest from perception.<sup>37</sup> [R3] And the most exact of the sciences are the ones concerned most of all with the primary things, since the sciences which proceed from fewer things (for example, arithmetic) are more exact than those that proceed from an addition (for example, geometry).<sup>38</sup> [R4] But then, too, the one that provides theoretical scientific knowledge of the causes is more teachable, since teaching is what those people do, that is, those who state the causes of each thing. [R5] And knowing or knowing scientifically for its own sake most of all belongs to the science of what is most scientifically knowable of all. For the person who chooses to know scientifically because of itself will most of all choose to have what is most of all scientific knowledge, and this is the science of what is most scientifically knowable of all. And what is most scientifically knowable of all are the primary things and causes, since it is through these and proceeding from these that we know the other things, not these because of the ones that fall under them.<sup>39</sup> [R6] But the most ruling of the sciences—that is, the one that is ruling rather than subordinate—is the one that knows that for the sake of which each thing is to be done, and this is the good of each of them, and in general the best good in all of nature.<sup>40</sup>

So based on all that has been said, the name we are inquiring into applies to the same science [as has all these features]. For this must be the one that gets a theoretical grasp on the primary starting-points and causes, and the good or the for-the-sake-of-which is one of these causes.<sup>41</sup>

That it is not a productive science is clear too from those who first turned to philosophy, since it is because of wondering at things that humans, both now and at first, began to do philosophy.<sup>42</sup> At the start, they wondered at those of the puzzles that were close to hand, then, advancing little by little, they puzzled over greater issues, for example, about the attributes of the moon and about issues concerning the sun and stars, and how the universe comes to be.<sup>43</sup> Someone who puzzles or wonders, however, thinks himself ignorant (it is because of this, indeed, that the philosopher is in a way a mythlover, since myth is composed of wonders).<sup>44</sup> So if indeed it was because of [a desire] to avoid ignorance that they engaged in philosophy, it is evident that it was because of [a desire] to know that they pursued scientific knowledge, and not for the sake of some sort of utility.

What in fact happened is witness to this. For it was when pretty much all the necessities of life, as well as those related to ease and passing the time, had been supplied that such wisdom began to be sought.<sup>45</sup> So clearly we do not inquire into it because of its having another use, but just as a human being is free, we say, when he is for his own sake and not for someone else, in the same way we pursue this as the only free science, since it alone is for its own sake.<sup>46</sup>

It is because of this indeed that the possession of this science might be justly regarded as not for humans, since in many ways the nature of humans is enslaved, so that, according to Simonides, "a god alone can have this privilege," and it is not fitting that a human should not be content to inquire into the science that is in accord with himself.<sup>47</sup> If, then, there is something in what the poets say, and jealousy is natural to the divine, it would probably occur in this case most of all, and all those who went too far [in this science] would be unlucky. The divine, however, cannot be jealous—but, as the proverb says, "Bards often do speak falsely."<sup>48</sup> Moreover, no science should be regarded as more estimable than this.<sup>49</sup> For the most divine science is also the most estimable. And a science would be most divine in only two ways: if the [primary] god most of all would have it, or if it were a science of divine things.<sup>50</sup> And this science alone is divine in both these ways. For the [primary] god seems to be among the causes of all things and to be a sort of starting-point, and this is the sort of science that the [primary] god alone, or that he most of all, would have.<sup>51</sup> All the sciences are more necessary than this one, then, but none is better.<sup>52</sup>

The acquisition of it, however, must in a way leave us in a condition contrary to the one in which we started our search. For everyone, as we said, starts by wondering at something's being the way it is, just as people do at those wondrous automata, when they do not have a theoretical grasp on their cause, or at the turnings of the sun, or at the incommensurability of the diagonal (for it seems a wonder to everyone that a more-than-minimal magnitude is not measurable).<sup>53</sup> It is in the contrary and proverbially the better condition, however, that we must end up, as happens in those other cases too when people learn [the cause]. For nothing would make a man who knows geometry wonder more than if the diagonal *were* to turn out to be commensurable.<sup>54</sup>

We have stated, then, what the nature is of the science we are inquiring into, and what the target is that our inquiry and our whole methodical inquiry must hit.<sup>55</sup>



## A 3

It is evident, then, that we must acquire scientific knowledge of the causes that are starting-points, since we say that we know each thing when we think we know its primary cause.<sup>56</sup> Now, things are said to be causes in four ways.<sup>57</sup> In one way, we say the substance or the essence is the cause, since the ultimate thing to which the why leads us is the account, and the why that is primary is the cause and starting-point.<sup>58</sup> In another, it is the matter or the underlying subject.<sup>59</sup> In a third, it is the starting-point from which the movement derives. In a fourth, the cause opposite to this, that is, the for-the-sake-of-which and the good, since this is the end of all coming to be and of all movement.<sup>60</sup>

We got an adequate theoretical grasp on these in our works on nature.<sup>61</sup> All the same, let us call also on those prior to us who undertook the investigation of beings and philosophized about the truth.<sup>62</sup> For it is clear that they too speak of certain starting-points and causes. So reviewing them will be of some assistance to the present methodical inquiry, since either we shall discover some other kind (*genos*) of cause or trust all the more in those we mentioned just now.

Of those who first philosophized, then, most thought that the starting-points of all things were of the material kind (*eidos*) only.<sup>63</sup> For that from which all beings come, and from which as a first thing they come to be and into which they pass away in the end, the substance that persists throughout as an underlying subject while its attributes change—this, they say, is the element and this is the starting-point of beings.<sup>64</sup> And because of this they think that nothing either comes to be or is destroyed, since a nature of this sort is always preserved. Just as we do not say either that Socrates unconditionally comes to be when he comes to be noble or musical or that he is destroyed when he loses these states, because the underlying subject—Socrates himself—persists, so too they do not say that anything does so in the other cases.<sup>65</sup> For there must be some nature, whether one or more than one, from which the other things come to be while it is preserved.

They do not all agree, however, on the number and kind (*eidos*) of such a starting-point. Thales, the one who started this sort of philosophy, says it is water (because of this, he also declared that the earth rests on water), perhaps reaching this supposition from seeing that the nourishment for all things is moist, that the hot itself comes to be from this, and what is alive lives by this (and what they come to be from is starting-point for all).<sup>66</sup> Because of this, then, he reached this

25 supposition, and because the seeds of all things have a moist nature, and water is the starting-point of the nature of moist things.

30 Some people think that even the ancients who lived long before the present generation and who first theologized held similar beliefs about nature, since they made ocean and Tethys the parents of coming to be, and made the gods swear their oath by the water they called Styx.<sup>67</sup> For what is oldest is what is most estimable, and what is most estimable is what we swear an oath by.<sup>68</sup> It is perhaps unclear that this belief about  
984<sup>a</sup>1 nature is in any way ancient or even old, but Thales at any rate is said to have declared this about the primary cause (for no one would consider Hippo worthy of inclusion with these, because of the shabbiness of his thought).<sup>69</sup>

5 Anaximenes and Diogenes posit air as prior to water and as more than anything else the starting-point of the simple bodies.<sup>70</sup> Hippasus of Metapontium posits fire, as does Heraclitus of Ephesus.<sup>71</sup> Empedocles, however, posits four things, positing earth along with those already mentioned as a fourth (for these, he says, always persist and do  
10 not come to be, except in quantity or smallness, aggregating into one and disaggregating from one).<sup>72</sup>

Anaxagoras of Clazomenae, who was prior to Empedocles in age but in works later, says that the starting-points are unlimited.<sup>73</sup> For he says that pretty much all the homoeomerous things (like water and fire) come to be and are destroyed in this way, namely, through aggregation and disaggregation alone.<sup>74</sup> Otherwise, they neither come to be  
15 nor are destroyed but persist and are eternal.

From this, we might think that the only cause is the so-called material kind (*eidōs*). But as people progressed thusly the facts themselves showed them the way and compelled them to inquire further.<sup>75</sup> For however much all coming to be and passing away may be from some one thing (or even from more than one thing), *why* does this happen? That is, what is the *cause*? For at any rate the underlying subject itself does not make itself change. I mean, for example, that neither the wood nor the bronze is a cause of either of them changing, nor does the wood make a bed or the bronze a statue, but something else is the cause of the change, and to look for this is to look for another starting-point—the  
25 starting-point from which the movement derives, as we would say.<sup>76</sup>

Well then those who at the very start latched on to this methodical inquiry, and said that the underlying subject was one, had no misgivings about this. But *some* of those who said that it was one, as if  
30 defeated by this inquiry, said that the one, that is, nature as a whole, is immovable—not only as regards coming to be and passing away (for this is an ancient view agreed to by all), but also as regards every other

sort of change, and this view is special to them.<sup>77</sup> Of those who said that the universe is one, then, none managed to discover a cause of this sort, except perhaps Parmenides, insofar as he posited causes not only as one but also somehow as two.<sup>78</sup> Accordingly, for those who make a plurality [of underlying subjects] it is more possible to state [what this sort of cause is]—for example, for those [who posit] hot and cold or fire and earth. For they treat fire as having a nature that initiates movement, and treat water, earth, and things of that sort in the contrary way.

After these thinkers and these sorts of starting-points, which were found inadequate to generate the nature of beings, people were again compelled by the truth itself, as we said, to look for the next sort of starting-point.<sup>79</sup> For that the good or noble state of some beings—or the coming to be in that state of other ones—should have fire or earth or anything else of that sort as its cause is presumably not probable, nor is it probable that these people should have thought so.<sup>80</sup> On the other hand, to turn over so important a fact to chance or luck could not be correct either.<sup>81</sup> When one person said, then, that understanding was present (just as in living things) in nature too, as the cause of the cosmos and of all its order, he seemed like a sober person by contrast with his improbability-uttering predecessors.<sup>82</sup> We know that Anaxagoras explicitly adopted these accounts, but Hermotimus of Clazomenae is “charged” with speaking that way earlier.<sup>83</sup> Those who took up the matter in this way thus posited the cause of their noble state as a starting-point of beings, and at the same time that this is the sort of cause from which the movement starts for them.

#### A 4

We might suspect that Hesiod was the first to look for this sort of thing, or someone else who posited love (*erôs*) or appetite among beings as a starting-point, as, for example, Parmenides also did.<sup>84</sup> For he too, in describing the coming to be of the universe, says that first “was devised love (*erôs*) among the gods.”<sup>85</sup> And Hesiod says,

Of all things the very first that came to be was chaos, and then  
Broad-breasted earth,  
And love (*erôs*), preeminent among all the immortals,

on the supposition that there must be some cause among beings to move and draw things together.<sup>86</sup> (As for the way these people should be arranged with regard to priority, let us leave it till later to discern.<sup>87</sup>)

But since it was evident that the contraries of good things were also present in nature (not only order and nobility but also disorder and baseness, and more bad things than good ones, and more base things than noble ones), someone else accordingly introduced love (*philia*) and strife as each singly the cause of one of the two sorts of things.<sup>88</sup> For if we were to follow and grasp the *thought* and not the inarticulate words of Empedocles, we would find that love (*philia*) is the cause of good things and strife of bad ones.<sup>89</sup> So, if we were to claim that Empedocles in a way says, and was the first to say, that the good and the bad are starting-points, we would perhaps be correct—if indeed the cause of all good things is the good itself.<sup>90</sup>

These people, then, as we say, evidently latched on to two of the causes we distinguished in our works on nature, namely, the matter and the starting-point of movement.<sup>91</sup> But they did so vaguely and in a not at all perspicuous way, like untrained people in fights.<sup>92</sup> For these too, as they circle their opponents, often strike good blows, but they do not do so in virtue of scientific knowledge, just as the others do not seem to know what they are saying, since they apparently make pretty much no use of these causes, except to a small extent.<sup>93</sup>

For Anaxagoras uses understanding as a *deus ex machina* as regards cosmic production, and, when he is puzzled about what the cause is due to which something holds of necessity, he drags understanding in, but in other cases he makes anything rather than understanding the cause of things that come to be.<sup>94</sup>

As for Empedocles, although he uses these causes to a greater extent than Anaxagoras, he neither uses them adequately nor finds any consistency in them. At any rate, love (*philia*) often disaggregates things for him, while strife aggregates them. For whenever the universe is divided up into its elements because of strife, the fire is aggregated into one, and so is each of the other elements, and whenever things come together into one again under the influence of love (*philia*), it is necessary that the parts from each get disaggregated again.<sup>95</sup>

Empedocles, then, going beyond his predecessors, was the first to introduce the dividing of this cause, not making the starting-point of the movement one thing, but distinct and contrary ones. Further, he was the first to say that the kinds (*eidos*) of matter, the so-called elements, were four. Yet he does not use four but treats them as two only, fire by itself, on the one hand, and its opposites—earth, air, and water—taken as one nature, on the other (as we may gather from studying his verses).<sup>96</sup> He, then, as we say, spoke about the starting-points in this way and as being this many.

Leucippus, however, and his associate Democritus say that the full and the void are the elements, calling the one "being," and the other "not being," and, of these, the full or the solid is being, while the void is not being (that is why they also say that being no more *is* than not being, because the body no more *is* than the void), and that these, as matter, are the causes of beings.<sup>97</sup> And just as those who make the underlying substance one generate the other things by means of its attributes, positing the rare and the dense as starting-points of these attributes, in the same way, these people too say that the differentiae are the causes of the other things. And these differentiae, they say, are three—shape, order, and position.<sup>98</sup> For they say that being is differentiated by "rhythm," "contact," and "turning" alone. And of these rhythm is shape, contact is order, and turning is position.<sup>99</sup> For A differs from N in shape, AN from NA in order, and Z from N in position. But the question of movement—where it comes from and in what way it belongs to beings—these people, in a quite similar way to the others, carelessly neglected.<sup>100</sup>

So concerning the two causes, as we say, this seems to be as far as the earlier philosophers went in their inquiry.

## A 5

Among these thinkers and before them, the so-called Pythagoreans were the first to latch on to mathematics.<sup>101</sup> They both advanced these inquiries and, having been brought up in mathematics, thought that its starting-points were the starting-points of all beings. Since [1] among these starting-points the numbers are by nature primary, and since [2] they seemed to get a theoretical grasp on many similarities to beings in the numbers, and to things that come to be, more so than in fire, earth, or water (for example, that such-and-such an attribute of numbers is justice, that such-and-such an attribute is soul and understanding, whereas another one is appropriate time, and—one might also say—each of the rest likewise), and, further, [3] seeing in harmonies attributes and ratios that are found in numbers—since, then, [2] the other things seemed to have been made like numbers in the whole of their nature, and [1] numbers were primary in the whole of nature, they took the elements of numbers to be the elements of all beings, and [3] the whole heaven to be harmony and number.<sup>102</sup>

And whenever they found consistencies and harmonies in the numbers with the attributes and parts of the heaven and with the whole arrangement of the cosmos, they collected these together and fitted

them into their scheme.<sup>103</sup> And if there was something missing, they added it eagerly, in order to make their work a connected whole. I mean, for example, that since the number ten seems to be complete and to encompass the whole nature of the numbers, they say that the bodies that move through the heaven are ten, but because those that are visible are only nine they make anti-earth the tenth.<sup>104</sup>

We have discussed these issues more exactly elsewhere.<sup>105</sup> But we are going over them again in order that we may grasp on the part of these thinkers too the starting-points they posit, and in what way these fall under the causes we have been speaking about. It is evident, then, that they too consider that number is a starting-point for beings both as matter and as attributes and states, that the elements of number are the odd and the even, and that of these the odd is limited and the even unlimited.<sup>106</sup> They consider that the one comes from both of these (for it is both odd and even), that number comes from the one, and that the whole of the heaven (as has been said) is numbers.<sup>107</sup>

Others among these same thinkers say that there are ten starting-points arranged in two columns:<sup>108</sup>

limited	unlimited
odd	even
one	plurality
right	left
male	female
resting	moving
straight	curved
light	darkness
good	bad
square	rectangular

This is the way in which Alcmaeon of Croton also seems to have taken things, and either he got this account from them or they got it from him.<sup>109</sup> For Alcmaeon too made claims quite similar to theirs, since he says that most things relating to humans come in twos, mentioning not definite contraries, as these thinkers did, but random ones—for example, white and black, sweet and bitter, good and bad, great and small. He threw out indefinite suggestions about the rest, whereas the Pythagoreans made claims both about how many contraries there are and what they are.<sup>110</sup>

From both of these, then, we can grasp this much, that the contraries are the starting-points of beings, and from the first lot how many and what they are. Yet in what way these can be brought together

and related to the causes we have mentioned has not been articulated by them in a perspicuous way. They seem, however, to range the elements among the material kinds (*eidos*). For it is from these as components that they say the substance of things is composed and molded.

As for the ancients, then, and those who spoke of the elements as plural, we can get an adequate theoretical grasp on their thought from these considerations. There are some, however, who made claims about the universe as being of a singular nature—although not all of them did so in an equally correct way or in a way equally in accord with the facts of nature.<sup>111</sup> So an account of these thinkers is in no way appropriate to our present investigation of causes.<sup>112</sup> For whereas some of the physicists take it that being is one thing, yet at the same time posit coming to be from the one thing as from matter, these thinkers proceed in another way.<sup>113</sup> For the former are positing movement in addition (making the universe *come to be*), whereas the latter say that it is immovable.<sup>114</sup>

However, this much at least does properly belong to the present investigation: Parmenides seems to latch on to what is one in account, Melissus onto what is one as regards the matter (which is why Parmenides says that it is limited, Melissus that it is unlimited). Xenophanes, by contrast, who was the first of these monists (Parmenides is said to have been his student), said nothing perspicuous, nor does he seem to have touched upon the nature of either of these causes, but with a view to the heaven as a whole he says that the one is the god.<sup>115</sup> Now these thinkers, as we said, must be set aside for the purposes of the present investigation—two of them entirely as being a little boorish, namely, Xenophanes and Melissus. Parmenides, however, seems perhaps to speak with more insight. For claiming that beyond being there is no such thing as not being, he thinks that being is necessarily one and that nothing else exists (about this we have spoken more perspicuously in our works on nature).<sup>116</sup> But finding himself compelled to follow the things that appear to be so, he takes it that there is one thing according to reason but more than one according to perception, and now posits two causes and two starting-points, hot and cold—in other words, fire and earth.<sup>117</sup> And of these he ranges the first with being and the second with not being.

So from what has been said, and from the account of the wise men who have now sat in council with us, we have got this much: From the first thinkers we got that the starting-point is corporeal (for water and fire and things of that sort are bodies), some positing one corporeal starting-point, others more than one, but both putting them as

such among the material kinds (*eidōs*). From some, who posit both this cause and besides it the one from which the movement derives, which we got as one from some, and from others as two.<sup>118</sup> So up to the Italians, and apart from them, the rest spoke rather vaguely about these things except that, as we said, they have in fact made use of two causes, and some made the second of them (the one from which the movement derives) one, others two.<sup>119</sup>

The Pythagoreans have spoken of the starting-points as two in the same way, but added this much, which is in fact special to them.<sup>120</sup> They thought that the limited and the unlimited were not certain distinct natures, such as fire or earth or anything else of that sort, but that the unlimited itself and the one itself were the substance of the things of which they were predicated, and that is why number was the substance of all things.<sup>121</sup> On these topics, then, they made claims this way, and so about the what-it-is they also started to speak and to give definitions, even if they treated the topic too simply.<sup>122</sup> For they defined superficially and also the first subject to which a given definition applied, this they believed to be the substance of the thing—as if someone were to think that double and two were the same, because in the first instance double belongs to two.<sup>123</sup> But being double and being two are presumably not the same. Otherwise, the one will be many—a consequence that they in fact drew.

From the earlier thinkers, then, we can grasp this much.

## A 6

After the philosophies we have mentioned came the work of Plato. In most respects it followed these thinkers but also had special features that distinguished it from the philosophy of the Italians. For having been from his youth familiar first with Cratylus and the Heraclitean beliefs that all perceptibles are always flowing, and that there is no scientific knowledge concerning them, these views he also held later.<sup>124</sup> The work Socrates did, on the other hand, was concerned with ethical issues, not at all with nature as a whole. In these, however, he was inquiring into what is universal and was the first to fix his thought on definitions. Plato, accepting him [as a teacher], took it that this fixing is done concerning other things and not the perceptible ones, since it is impossible for there to be a common definition of any perceptibles, as *they* at any rate are always changing.<sup>125</sup> He, then, called beings of this other sort “Ideas,” and the perceptible ones are beyond these and are all called after these.<sup>126</sup> For the many things that have the same name as the Forms are [what they are] through participation in them.<sup>127</sup>



As for participation he changed only the name.<sup>128</sup> For the Pythagoreans say that beings are [what they are] by imitating the numbers, whereas Plato says that they are [what they are] by participation, changing the name.<sup>129</sup> What this participation or this imitation of the Forms could be, however, they left an open question.

Further, apart from both the perceptibles and the Forms are the objects of mathematics, he says, which are intermediate between them, differing from the perceptible ones in being eternal and immovable, and from the Forms in that there are many similar ones, whereas the Form itself in each case is one only.<sup>130</sup> And since the Forms are causes of the other things, he thought that their elements were the elements of all beings. It is as matter, then, that the great and the small were starting-points, and as substance, the one.<sup>131</sup> For generated [as they are] from the great and the small by participating in the one, the Forms are the numbers.<sup>132</sup>

In saying that the one is substance, and is not by being *another* thing said to be one, he spoke in a quite similar way to the Pythagoreans, and in saying that the numbers are the causes of the substance of other things he agreed with them.<sup>133</sup> But instead of making the unlimited one thing making it a dyad from the great and the small is special to him. Further, in his view too the numbers are beyond the perceptibles, whereas they say that the things themselves are numbers, and do not place the objects of mathematics between them.<sup>134</sup>

The fact that he made the one and the numbers be beyond the things, not treating them as the Pythagoreans did, and that he introduced the Forms, were due to his investigation of accounts (for the previous thinkers had no share of dialectic), and the fact that he made the other nature a dyad was because he thought that the numbers, except those that were prime, were naturally well disposed to being generated from this as from some plastic material.<sup>135</sup> And yet what *happens* is the contrary. For it is not reasonable that it should happen in the way Plato describes. For, as things stand, they make many things from the matter, whereas the Form generates only once, but what is evident is that from one matter comes one table, while the person who imposes the Form, though he is one, makes many.<sup>136</sup> And the relation of male to female is similar. For the female is impregnated by one copulation, but the male impregnates many. And yet these are imitations of those starting-points.<sup>137</sup>

About the topics of inquiry, then, Plato described things this way. It is evident, however, from what has been said, that he made use of only two causes, that of the what-it-is and that of the matter (for the

Forms are the causes of the what-it-is of other things, as the one is of the Forms).<sup>138</sup> And what the underlying matter is, of which the Forms are said in the case of the perceptibles, and the one in the case of the Forms, is evidently a dyad, namely, the great and the small.<sup>139</sup> Further, he has assigned the cause of good and bad to both elements, one to each, which we say some of the previous philosophers also looked to do—for example, Empedocles and Anaxagoras.<sup>140</sup>

## A 7

We have, then, briefly and in summary fashion gone through which thinkers have spoken and in what ways about the starting-points and about the truth.<sup>141</sup> Nonetheless we have got this much at least from them, that of those who have spoken about a starting-point and a cause none has mentioned any outside of those we distinguished in our works on nature, rather it is evident that they are all in some vague way touching upon these.<sup>142</sup> For some speak of the starting-point as matter, whether they posit one or many, and whether they make it a body or something incorporeal—for example, Plato speaks of the great and the small, and the Italians of the unlimited, Empedocles of fire, earth, water, and air, Anaxagoras of the unlimited number of homoeomerous things. All these thinkers, then, latched on to this sort of cause, and so too did those who spoke of air, fire, water, or something denser than fire and more fine-grained than air—for some have also said that the primary element is like this.<sup>143</sup> So these thinkers latched on to this cause alone, and certain others onto the starting-point from which movement derives—for example, those who made love (*philia*) and strife or understanding and love (*erôs*) a starting-point.

But the essence and the substance no one has presented in a perspicuous way, although those who posit the Forms speak of it the most.<sup>144</sup> For they neither take the Forms as matter for the perceptibles, and the one as matter for the Forms, nor these as the starting-point from which movement comes about (for they say that these are rather causes of immobility and of being at rest); instead, the Forms provide the essence for each of the other things, and the one provides it for the Forms.

And that for the sake of which actions, changes, and movements take place they speak of as in a way a cause, but not in this way—that is, not in the way in which it is its *nature* to be a cause. For those who speak of understanding or love (*philia*) posit these causes as good, but they do not speak as if anything is or comes to be *for the sake of*

these things, but as if movements arise from them. In the same way too those who say that the one or being is such a nature say that it is a cause of the substance, but not that anything is or comes to be *for its sake*, so that in a way they do and in a way they do not say that the good is a cause, since they do not say it is so unconditionally but coincidentally.<sup>145</sup>

It is clear, then, all these thinkers also seem to testify that we have correctly distinguished the causes, how many they are and what they are, since they have been unable to touch upon any other cause, and, in addition, that the starting-points must be looked for in all these ways or in some of them.<sup>146</sup> But as for how each of these people has spoken and how he stands concerning the starting-points, let us next, so far as is possible, go through the puzzles about these.<sup>147</sup>

## A 8

Those thinkers, then, who posit that the universe is one and also posit a single nature as matter, and this corporeal and having magnitude, clearly err in many ways.<sup>148</sup> For they posit the elements of bodies alone, but [1] not of the incorporeal things, although incorporeal ones are also beings.<sup>149</sup> And when they try to state the causes of coming to be and passing away and to give a physical account of all things, [2] they do away with the cause of movement.<sup>150</sup> Further, they err by [3] not positing the substance (that is, the *what-it-is*) as a cause of anything, and in addition [4] by too readily speaking of any of the simple bodies except earth as the starting-point, without investigating the way these things come to be from each other—I mean, fire, water, earth, and air. For some come to be from each other by aggregation and others by disaggregation, and with respect to priority and posteriority this makes a great difference. For in one way the most elemental thing of all would seem to be the primary one from which they come to be by aggregation, and this would be the most fine-grained of the bodies and the one having the smallest parts.

That is why those who posit fire as starting-point would most of all be speaking in agreement with this account. But each of the others also agrees that the element of the bodies is a thing of this sort. At any rate, none of those who say that it is one thought that earth is the element, clearly because of the largeness of its parts, whereas of the three [other candidate] elements each has found some judge in its favor, for some say that it is fire, others that it is water, others that it is air.<sup>151</sup> And yet why don't they also say earth, as ordinary men do?<sup>152</sup> For these say that all things are earth, and Hesiod too says that earth was the first of the

bodies to come to be (thus it turns out that the supposition is ancient as well as popular).<sup>153</sup> So according to this account if someone said it is one of these things other than fire or posited that it is denser than air but more fine-grained than water, he would not be speaking correctly. But if what is posterior in coming to be is prior in nature, and what is concocted and aggregated is posterior in coming to be, the result would be the contrary of this, water being prior to air and earth to water.<sup>154</sup>

About those, then, who posit one cause of the sort we described, let so much be said. But the same would apply if someone posits that these are more than one, in the way that Empedocles says that the matter is four bodies. For he too necessarily incurs consequences, some of which are the same as before, while others are special to him.<sup>155</sup> For [5] we see these bodies coming to be from one another in such a way that the same body does not always remain fire or earth (we have spoken about this in our works on nature).<sup>156</sup> Also, about the cause of movement, whether we must posit one or two, he must be thought to have spoken neither correctly nor altogether reasonably.<sup>157</sup> Generally, too, those who speak this way necessarily do away with alteration, since cold will not come from hot or hot from cold.<sup>158</sup> For if it did, there would be something that received these very contraries, and there would be some one nature that became fire and water, which this thinker does not say.

If we were to take Anaxagoras to say that there are two elements, what we took him to say would be most in accord with an account that he himself did not articulate, although he would necessarily have had to follow those who do advance it.<sup>159</sup> For to say that at the start all things had been mixed is both strange on other grounds and because it follows that they must have been unmixed before the start, and because a random thing cannot naturally be mixed with a random thing, and in addition because attributes—even [intrinsic] coincidents—would be separated from substances (since of the same things as there is mixture there is also separation).<sup>160</sup>

Nonetheless, if someone were to follow along with him while at the same time helping to articulate distinctly what he wishes to say, he would presumably appear to be speaking in a more advanced way. For when nothing was yet separated out, clearly nothing could be truly said of the substance that was there. I mean, for example, that it was neither white nor black nor gray nor any other color, but of necessity colorless, since otherwise it would have had one of these colors. And similarly it was flavorless, by this same argument, and had not a single one of the similar attributes, since it could have neither some quality

nor some quantity nor some what.<sup>161</sup> For otherwise one of the particular forms would have belonged to it (and this is impossible, because all were mixed together), since it would have already been separated out (and he says that all things were mixed except understanding, which was alone unmixed and pure).<sup>162</sup> From this, then, it follows that he must say that the starting-points are the one (for this is simple and unmixed) and the other, which is such as we posited the indefinite to be, before it is given definition and participates in some form.<sup>163</sup> And so, while he speaks neither correctly nor perspicuously, he means something like what later thinkers were saying and now appears more and more to be the case.<sup>164</sup>

But in fact these thinkers are at home only in accounts concerning coming to be, passing away, and movement, since it is pretty much only of this sort of substance that they look for the starting-points and causes. Those, however, who make their theoretical knowledge concern all beings, positing that some beings are perceptible whereas others are imperceptible, are clearly conducting an investigation of both kinds (*genos*). That is why we should spend more time seeing what they say correctly and what incorrectly in the investigation of the topics now before us.

The so-called Pythagoreans use their starting-points and elements in a stranger way than the physicists.<sup>165</sup> This is because they did not take these from perceptibles (for mathematical beings are without movement, except for those with which astronomy is concerned).<sup>166</sup> Yet all their discussions and the topics they busied themselves with were concerned with nature. For they generate the heaven, and, where its parts, attributes, and workings are concerned, they closely observe the things that happen, and they use up their starting-points and their causes on these, as if agreeing with the various physicists that being is just this, namely, what is perceptible and is embraced by the so-called heaven.<sup>167</sup> But the causes and starting-points they mention are, as we said, adequate to go up even to higher beings, and are more fitted to these than to accounts concerned with nature.<sup>168</sup> About what way there can be movement, however, if limited and unlimited and odd and even are the only things assumed, they have nothing to say, or about how it is possible without movement and change for there to be coming to be and passing away or the workings of the bodies that are moved throughout the heaven.<sup>169</sup>

Further, if either we granted them that spatial magnitude consists of these elements or that this were shown, still in what way would some bodies be light and others have weight? For, based on what they assume and say, they are speaking no more about mathematical bodies

than about perceptible ones.<sup>170</sup> And the reason why they have said nothing whatever about fire, earth, or the other bodies of this sort is precisely, I think, because they have nothing special to say about perceptible bodies.

Further, how should we take the attributes of number and number itself to be causes of the things that are and that come to be in the heaven both at the start and now, when there is no other number besides this number for the cosmos to be composed of? For when they say that belief and appropriate time are found in such-and-such a part of the cosmos, and injustice and disaggregation or mixture a little above or below, and say that a demonstration of this is that each of these is a number, but there happens to already be a plurality of composed magnitudes in the relevant place, because these attributes follow along with the corresponding places, is this the same [sort of] number, the one in the heaven, that we must take each of these things to be, or is it another [sort] than this?<sup>171</sup> For Plato says it is another. Although he too thinks that both these things and their causes are numbers, but that the intelligible numbers are causes, whereas the other ones are perceptible.<sup>172</sup>

## A 9

Let us leave aside the views of the Pythagoreans now, since it is enough that we have latched on to them to this extent. As for those who posited the Ideas, first, [1a] in looking to find the causes of the beings that exist here, they introduced others, equal in number to these—as if a person who wished to count the beings were to think that he would not be able to do it while there were so few of them, and so tried to count them by making more.<sup>173</sup> For the Forms are pretty much equal in number to—or no fewer than—the things whose causes they were inquiring into, in proceeding from them to the Forms.<sup>174</sup> For [1b] in each case there is something that has the same name, both among the other things of which there is a one over many and beyond the substances, both over the things that exist here and over the eternal things.<sup>175</sup>

Further, of the ways in which we show that there are Forms none makes these evident.<sup>176</sup> [2] For from some of these ways no deduction is necessarily generated, whereas from some Forms are also generated of things of which we think there are no Forms.<sup>177</sup> For, [2a] according to the arguments from the sciences, there will be Forms of all things of which there are sciences, and [2b] according to “the one over many” there will be Forms even of negations, whereas [2c] according to the

argument that there is understanding of a thing that has passed away there will be Forms of things that pass away, since there is an appearance of them.<sup>178</sup>

Further, of the more exact of the arguments, [3a] some produce Ideas of relatives, of which we say there is not an intrinsic kind (*genos*), whereas [3b] others introduce the *Third Man*.<sup>179</sup>

[4] And in general the arguments for the Forms do away with the things whose existence we, as people who speak of Forms, prefer to the existence of the Ideas, since it follows [4a] that it is not the dyad that is primary but number, [4b] and that the relative is prior to the intrinsic, as well as all the other things that certain people, by following out the beliefs held about the Ideas, have accepted contrary to the starting-points.<sup>180</sup>

Further, [5a] by the supposition according to which we say that there are Ideas, there will be Ideas not only of substances but also of many other things (for [2c] the intelligible object is a one not only where substances are concerned but also in the case of the other things, and [2a] there are sciences not only of substance but also of the other things, and countless other such difficulties arise).<sup>181</sup> On the other hand, [5b] in accord with the necessities of the case and with the beliefs held about them, if the Forms are to be participated in, there must be Ideas of substances only, for they are not participated in coincidentally but rather a thing must participate in each in this way, namely, insofar as it is not said of an underlying subject (I mean, for example, if something participates in double-itself, it also participates in the eternal, but does so coincidentally, since it is coincidental to the double that it is eternal), so that the Forms will be substance.<sup>182</sup> [6] But it is the same things that signify substance here as over there—or what will it mean to say that there is something beyond these things here, the one over the many?<sup>183</sup> And if the Ideas and what participate in them are the same in form, there will be something common to these. For why should the two be one and the same in the case of the twos that pass away, and in those that are many but eternal, rather than in the case of [two-] itself and some particular [two]? But if they are not the same in form, they would be homonymous, just as if someone were to call Callias and a wooden statue a man, seeing nothing communal between them.<sup>184</sup>

Above all, though, we might go through the puzzles about what on earth the Forms contribute to perceptibles, either to those that are eternal or to those that come to be and pass away, since [7] they are not the cause of movement or of any change whatsoever in them.<sup>185</sup> [8] But then they are also no help at all either as regards the scientific

knowledge of the other things, since they are not their substance (otherwise they would be in them) or [9] in relation to their being, if they are not components of the things that participate in them.<sup>186</sup> For if they were, they might perhaps seem to be causes in the way that what is white is a cause when mixed with a white thing. But this account is all too readily upset—it is one that first Anaxagoras and later Eudoxus and certain others stated.<sup>187</sup> For it is easy to collect many impossibilities against a belief of this sort.<sup>188</sup>

[10] But then neither is it possible to say, in any of the familiar ways of speaking, that the other things come *from* the Forms.<sup>189</sup> To say that they are paradigms and that the other things participate in them is to utter empty words and speak poetic metaphors. For what is it that makes things by looking to the Ideas? It is possible for anything both to be like and become like another thing without being copied from it, so that whether Socrates exists or not, someone could become like him. And the same would clearly hold even if Socrates were eternal. [11] Also, there will be more than one paradigm of the same thing and so more than one Form—for example, the Forms of man will be animal and two-footed, as at the same time will be man-itself.<sup>190</sup> [12] Further, the Forms will be paradigms not only of the perceptibles but also of themselves—for example, the genus, as genus of several species. And so the same thing will be paradigm and copy.<sup>191</sup>

[13] Further, it would seem to be impossible for the substance and that of which it is the substance to be separate.<sup>192</sup> And so how could the Ideas, if they are substances of things, be separate from them?

[14] In the *Phaedo*, however, it is said as follows: the Forms are causes both of the being and of the coming to be of things.<sup>193</sup> But even if the Forms do exist, the things that participate in them would still not come to be unless there was a moving cause. Also, many other things come to be—for example, a house or a ring—of which [2a] we say there are no Forms. And so it is clear that it is also possible for the others to be and to come to be through the same causes as the things we mentioned just now.

[15] Further, if indeed the Forms are numbers, in what way will they be causes?<sup>194</sup> Is it because the beings are other numbers—for example, this number here man, this one here Socrates, and this one here Callias? If so, why are the one lot the cause of the other lot? For even if the one lot are eternal and the other not, it will make no difference. If, on the other hand, the things that exist here are ratios of numbers (for example, a musical concord), it is clear that there is at least one thing of which they are the ratios.<sup>195</sup> If, then, this thing—the matter—is something definite, it is evident that the numbers themselves will also



be some ratios of something to something else.<sup>196</sup> I mean, for example, that if Callias is a ratio, expressible in numbers, of fire, earth, water, and air, it is also of certain other underlying things that his Idea too will be a number. And man-itself, whether it is some sort of number or not, will nonetheless be a ratio, expressible in numbers, of certain things and not a number, and nor, because of this [argument], will any Idea be a number.

[16] Further, one number may come to be from many numbers, but how can one Form come from many Forms?<sup>197</sup> And if it does not come from them themselves but from the things that are in a number (for example, in the myriad), how will it be with the units?<sup>198</sup> For if they are of the same form, many strange things follow, as they also do if they are not of the same form (whether the one lot as each other or all the lots as all the others).<sup>199</sup> For in which way will they differ, being without attributes? For these results are neither reasonable nor consistent with our understanding [of units].

[17] Further, they will have to introduce some other kind (*genos*) of number (with which arithmetic is concerned), as well as all the things called "intermediates" by some thinkers.<sup>200</sup> And how are these to exist and from what starting-points? Or why will they be intermediate between the things we find here and the things themselves?<sup>201</sup>

[18] Further, each of the units in the two comes from some prior two, but this is impossible.<sup>202</sup>

[19] Further, why is number, when taken all together, one?<sup>203</sup>

[20] Further, in addition to what has been said, if indeed the units are different, Platonists should have spoken like those who say that the elements are four, or two (for each of those says not that what is common—for example, body—is an element but rather fire and earth, whether [they think] there is something common to them—body—or not), but in fact they speak as if the one were homocomerous like fire or water.<sup>204</sup> If this is so, however, the numbers will not be substances, rather it is clear that—if indeed there is some one-itself and it is a starting-point—things are said to be one in various ways.<sup>205</sup> That would be impossible otherwise.

[21] When we wish to refer back substances to their starting-points we posit that lines come from the short and the long (that is, from a certain sort of small and great), plane from broad and narrow, and solid from deep and shallow, yet how, then, will either a surface have a line or a solid have a line and a surface?<sup>206</sup> For the broad and narrow is a kind (*genos*) distinct from deep and shallow. So, just as number is not present in these, because the many and few is distinct from them, it is clear that none of the higher ones will be present in the lower ones.

But then again the broad is not a kind (*genos*) of the deep either, since, then, a body would be a certain sort of plane.

[22] Further, as to the points, from what will their presence in lines come?<sup>207</sup> In fact, Plato used even to contest this kind (*genos*) as being a geometrical dogma. Instead, he called it "[the] starting-point of line," and often posited that it consisted of indivisible lines.<sup>208</sup> And yet these lines must have some limit, so that from the account on the basis of which a line exists, a point also exists.

[23] In general, though wisdom inquires into the cause of perceptible things, we left this alone (for we say nothing about the cause from which change starts), and—thinking that we are stating the substance of these things—we say that they are yet other substances, but as for the way in which these are substances of those, we state it through empty words.<sup>209</sup> For "participation," as we said earlier, means nothing.<sup>210</sup>

[24] As, then, for the very thing we see to be *the* cause for the sciences, the one because of which every understanding and every nature does things, the Forms in no way latch on to this cause either, which we say is one of the starting-points, instead mathematics has become philosophy for the present thinkers, although they say that we should busy ourselves with it for the sake of something else.<sup>211</sup>

[25] Further, the substance that is the underlying subject as matter we might take to be too mathematical, and to be more a predicate and a differentia of the substance and of the matter than matter proper—for example, the great and the small are like the rare and the dense that the physicists also speak about, calling these the primary differentiae of the underlying subject, since they are a sort of excess and deficiency.<sup>212</sup>

[26] And as for movement, if these things constitute movement, it is clear that the Forms will move. But if not, where does movement come from?<sup>213</sup> For the whole investigation concerning nature has been done away with.

[27] And what seems to be easy, namely, to show that all things are one, does not come about.<sup>214</sup> For by *ekthesis* it does not come about that all things are one, but—if we grant all [their assumptions]—that there is some one-itself, and not even that, if we do not grant that the universal is a genus, which in some cases is impossible.<sup>215</sup>

[28] And there is no account of the lengths, surfaces, and volumes that come after the numbers, either of the way they are or will be or of what capacity they have.<sup>216</sup> For these things cannot be Forms (since they are not numbers), or intermediates (since those are the objects of mathematics), or things that pass away, but appear to constitute another fourth kind (*genos*).

[29] In general, to look for the elements of beings without making distinctions, when they are said [to be] in many ways, makes it impossible to find them, and especially if one looks in this way for the sorts of elements they come from. For from what elements will doing or undergoing or straightness come?<sup>217</sup> Surely, it is not possible to get hold of these, but if indeed it is possible, it is only of the elements of substances. And so either to look for the elements of all beings or to think that we have found them is incorrect.<sup>218</sup>

[30] And how could we even learn the elements of all things? For clearly we cannot start by already knowing something that is prior to them. For just as a person who is learning geometry, though he may have prior knowledge of other things, has no prior knowledge of the things of which geometry is the science and about which he is trying to learn, so it is too, then, in the case of the other sciences, so that if there is a science of all things, of the sort some people say there is, a person who is to learn it should start by knowing nothing whatsoever. Yet all learning takes place through things of which there is prior knowledge, either of all of them or of some of them, that is, either [a] through demonstrations or definitions (for we must have prior knowledge of the things from which the definition comes and they must be well-known), and similarly too [b] in the case of learning through induction.<sup>219</sup> But then again if such knowledge were in fact innate, we might wonder *how* we could possess the most excellent of the sciences without being aware of it.<sup>220</sup>

[31] Further, how could we come to know the things from which it comes, and how is this to be made clear?<sup>221</sup> There is a puzzle about this too. For there might be a dispute about it, just as there is about certain voiced syllables. For some people say that ZA comes from S, D, and A, whereas others say that it is another sound, and not any of the well-known ones.<sup>222</sup>

[32] Further, as to the things of which there is perception, how could someone come to know them without having the relevant perception?<sup>223</sup> And yet he would have to, if in fact these are the elements from which all things come, just as complex sounds come from the elements that properly belong to them.

## A 10

It is clear even from what we previously said that all thinkers seem to have been inquiring into the causes that we mentioned in the *Physics*, and that we cannot mention any outside these. But [they touched upon] these vaguely, and so in a way they have all been discussed before, and in a way they have not been discussed at all. For early philosophy

15 concerning all things seemed to speak inarticulately, because it was  
young and at the starting-point, since even Empedocles says that bone  
exists as a result of its ratio, and this is the essence and the substance of  
the thing.<sup>224</sup> But then it is similarly necessary that flesh and each of the  
20 others should be its ratio, or that not one of them should. Hence it is  
because of this that both flesh and bone and everything else will exist,  
and not because of the matter, which *he* mentions—fire, earth, water,  
and air. But whereas if someone else had said this, he would necessarily  
have agreed, he has not said it in a perspicuous way.<sup>225</sup>

Well, about these things we have also made our views clear earlier.  
But let us go back again to whatever we might puzzle over concerning  
25 these very things. For maybe from these we might achieve something  
of a puzzle-free condition in connection with the later puzzles.<sup>226</sup>

## BOOK LITTLE ALPHA (II)<sup>227</sup>

### α 1

Theoretical knowledge concerning the truth is in one way difficult to get and in another way easy. An indication of this is that while none is capable of hitting upon it in the way it deserves, neither do all completely fail to hit it, but rather each has something to say about the nature of things, and whereas taken individually they contribute little or nothing to it, a gathering together of all results is a contribution of some magnitude. So if indeed the truth is like the proverbial barn door that none can miss, in this way it would be easy, but the fact that we can have some grasp on the whole while being incapable of grasping the part makes clear how difficult it is.<sup>228</sup>

Presumably too, since difficulties occur in two ways, it is not in the things but in us that the cause of this one lies. For as the eyes of bats are to the light of day so is the understanding in our souls to the things that are by nature most evident of all.<sup>229</sup>

It is a just thing, however, to be grateful not only to those whose beliefs we share, but also to those who have expressed more superficial views. For they have also contributed something, since they prepared the state [of the subject] for us. For if there had been no Timotheus, there would be much lyric poetry that we would not possess, but if there had been no Phrynus, there would have been no Timotheus.<sup>230</sup> It is the same way too with those who have expressed views about the truth, since from some thinkers we have received certain beliefs, whereas others caused these thinkers to become what they were.

It is also correct for philosophy to be called scientific knowledge of the truth. For of theoretical science the end is truth, whereas of practical science it is function (since, whenever practical people investigate the how of things, what they get a theoretical grasp on is the cause not intrinsically but in relation to something and now).<sup>231</sup> But we do not know the truth without its cause. Now, each [attribute] belongs most of all to something when it is because of it that a synonymous attribute also belongs to other things (for example, fire is the most hot thing, since it is the cause of heat in other things).<sup>232</sup> And so what is also most true is what causes all derivative things to be true. That is why the starting-points of the eternal beings must be most true (for they are not *sometimes* true, nor is there any cause of their being, instead they

30 themselves are a cause for the others), so that as each thing is as regards being, so it is too as regards truth.<sup>233</sup>

## α 2

994<sup>1</sup> But that there *is* some starting-point—that is, that the causes of beings are neither [1] an unlimited series nor [2] unlimited in kind (*eidos*)—is clear. [1] For neither is it possible for one thing to come from (*ek*) another as matter without limit (for example, flesh from earth, earth from air, air from fire, and so on without stopping), nor is it possible for the starting-point from which the movement comes to be such (for  
5 example, for a human to be moved by air, air by sun, sun by strife, and so on without limit). Similarly, the for-the-sake-of-which cannot go on without limit either (for example, walking for the sake of health, this for the sake of happiness, and happiness for the sake of something else, and so one thing always being for the sake of another), and in the case  
10 of the essence it is the same way.

For of medial things [in a series], since there is a last one and a prior one, the prior one must be the cause of the things that come after it. For if we had to say which of the three was the cause, we would say the first. For it is certainly not the *last*, since the final one causes nothing. But then it is not the medial one either, for it is the cause  
15 of only one thing (and it makes no difference whether there is one medial thing or more than one, nor whether they are unlimited or limited in number). But of series that are unlimited in this way, and of what is unlimited generally, all the parts are alike medial things down to now, so that if indeed there is no first one, there is no cause at all.<sup>234</sup>

But the series cannot go downward in this way without limit either, namely, with a starting-point above, so that from fire comes water, from water earth, and in this way some other kind (*genos*) of thing is always coming to be. For one thing comes from (*ek*) another in two ways (apart from the one in which *ek* means “after,” as in “the Olympic games come *ek* the Isthmian”), either [a] the way in which a man comes from a child by the child’s changing or [b] the way in which air comes from fire. [a] Now a man is said to come from a child  
25 in the way that what has come to be comes from what is coming to be, or as the completed thing comes from the thing that is being completed—for there is always an intermediate, so that as between being and not being there is coming to be, so too the thing that is coming to be is between the thing that is and the thing that is not, for the person who is learning is coming to be someone with scientific knowledge,

and this is what we mean when we say that from someone who is learning comes someone with scientific knowledge. [b] On the other hand, when something comes from another thing in the way that water comes from air, the other thing ceases to be. This is why [a] the former sort is not reversible, and a child does not come from a man (for it is not what comes to be *something* that comes to be as a result of coming to be but what exists after the coming to be [is complete], and it is in this way too that the day comes from the morning, because it comes after the morning, which is why the morning does not come from the day).<sup>235</sup> But [b] the other sort is reversible.<sup>236</sup> In both, however, it is impossible for them to go on without limit. For in [a] the former sort the intermediates must have an end, and in [b] the latter the change is reversible, since the passing away of either is the coming to be of the other.

At the same time, however, it is also impossible that the first [cause], since it is eternal, should pass away. For since coming to be is not without a limit in the upward direction, [a] the first thing from (*ek*) whose passing away something came to be must be non-eternal.<sup>237</sup>

And since the for-the-sake-of-which is an end, and the sort of end that is not for the sake of other things but rather other things are for its sake, it follows that if there is to be a last thing of this sort, the series will not be without a limit, but if there is no such thing, there will be no for-the-sake-of-which. Those who make it unlimited are unwittingly getting rid of the nature of the good (and yet no one would try to do anything if he were not going to come to a limit). Nor would there be any understanding present in beings. For someone who has understanding, at any rate, always does the actions he does for the sake of something, and this is a limit, since the end is a limit.<sup>238</sup>

But then neither can the essence be referred back to another definition that is fuller in account, since it is always the one that comes before that is more a definition, and not the one that comes after, and if the first one is not a definition, neither is the last.<sup>239</sup> Further, those who speak that way do away with scientific knowledge, since it is impossible to have knowledge until we come to indivisibles.<sup>240</sup> And knowing anything is impossible. For how can there possibly be understanding of what is unlimited in this way? For it is not like the case of a line, the divisibility of which does not stop, but which we cannot understand without making a stop.<sup>241</sup> That is why in traversing what is unlimited we cannot count the cuts, but rather the whole line must be understood by something that does not move [from cut to cut].<sup>242</sup> Also, there can be nothing that is unlimited, and if that is not so, at any rate the [definition of] what is unlimited is not unlimited.<sup>243</sup>

[2] But then if the kinds (*eidos*) of causes were unlimited in number, knowledge would again be impossible. For we think we know when we know the causes, but what is unlimited by addition cannot be gone through in a limited time.<sup>244</sup>

## α 3

Lectures, however, produce their effects in accord with people's habits, since we expect them to be spoken in the manner we are accustomed to, and anything beyond this appears not to have the same strength but to be something quite unknown and quite strange. For it is the customary that is familiar. Indeed, the extraordinary power of what we are accustomed to is clearly shown by our *customs*, where mythical and childish stories about things have greater power than our knowledge about them, because of our habits.

Now some people do not accept what someone says if it is not stated mathematically, others if it is not based on paradigm cases, while others expect to have a poet adduced as a witness. Again, some want everything expressed exactly, whereas others are annoyed by what is exact, either because they cannot string all the bits together or because they regard it as nitpicking. For exactness does have something of this quality, and so just as in business transactions so also in arguments it seems to have something unfree or ungenerous about it.<sup>245</sup>

That is why we should already have been well educated in what way to accept each argument, since it is absurd to look for scientific knowledge and for the way [of inquiry] characteristic of scientific knowledge at the same time—and it is not easy to get hold of either.<sup>246</sup> Accordingly, we should not demand the argumentative exactness of mathematics in all cases but only in the case of things that include no matter.<sup>247</sup> That is why the way of inquiry is not the one characteristic of natural science, since presumably every nature includes matter.<sup>248</sup> That is why we must first investigate what a nature is, since that way it will also be clear what natural science is concerned with, and whether it belongs to one science or to more than one to get a theoretical grasp on causes and starting-points.<sup>249</sup>



## BOOK BETA (III)

### B 1

It is necessary, with a view to the science we are inquiring into, first to go over topics about which we should first raise puzzles.<sup>250</sup> These include both topics about which people have supposed divergent things, as well as any separate from these that may have been overlooked. Now for those who wish to be puzzle-free it is useful to go through the puzzles well. For the subsequent puzzle-free condition is reached by untying the knots produced by the puzzles raised in advance, and it is not possible to untie a knot you are unaware of. But a puzzle in thought makes clear the existence of a knot in the subject matter.<sup>251</sup> For insofar as thought is puzzled it is like people who are tied up, since in both cases it is impossible to move forward.

That is why we must get a theoretical grasp on all the difficulties beforehand, both for these reasons and because those who inquire without first going through the puzzles are like people who do not know where they have to go. And, in addition, a person [who has not already grasped the puzzles] does not even know whether he has found what he is inquiring into.<sup>252</sup> For to someone like that the end is not clear, whereas to a person who has already grasped the puzzles it is clear. Further, a person is necessarily in a better position to make a judgment when—as if they were opposing parties in a court case—he has heard all the contending arguments.

[P1] The first puzzle is concerned with the topic we went through the puzzles about in our prefatory remarks, namely, whether it belongs to one science or to more than one to get a theoretical grasp on causes.<sup>253</sup>

[P2] And whether it is only the primary starting-points of substance that science has to look at, or whether it is also concerned with the starting-points on which everyone depends when proving things—for example, whether or not it is possible to affirm and deny one and the same thing at the same time, and other such starting-points.<sup>254</sup>

[P3] And if it is concerned with substance, whether there is one science concerned with all of them or more than one, and if more than one, whether they are all of the same kind (*genos*) or some of them should be called sorts of wisdom and others something else.<sup>255</sup>

[P4] And this itself is also one of the things that it is necessary to inquire into—whether we should say that only perceptible substances exist or also others beyond these, and [if so] whether there is one kind or several kinds (*genos*) of these substances, as is supposed by those who introduce both Forms and objects of mathematics that are intermediate between them and the perceptibles.<sup>256</sup>

[P5] These, then, as we say, we must investigate, and also whether the theoretical knowledge [we are investigating] is concerned only with substances or also with the intrinsic coincidents of substances.<sup>257</sup> In addition, concerning same and other, like and unlike, and contrariety, and concerning prior and posterior, and all the other such things that dialecticians try to investigate, making their investigation on the basis of reputable beliefs only—whose task is it to get a theoretical grasp on all these?<sup>258</sup> Further, [we must investigate] the intrinsic coincidents of these very things, and not only what each of them is, but also whether one thing is the contrary of one thing.<sup>259</sup>

[P6] Also, whether the starting-points and elements are the genera or the components present in each thing, into which it is divided.<sup>260</sup>

[P7] And if they are the genera, whether they are the first ones or the ultimate ones that are said of indivisible things—for example, whether animal or human is a starting-point and is to a higher degree beyond what is particular.<sup>261</sup>

[P8] Above all, we must inquire into, and work on, whether or not there is something, beyond the matter, that is an intrinsic cause, whether or not this is separable, whether it is one or more than one in number, and whether there is something beyond the compound (I mean by “the compound” whenever something is predicated of matter), or nothing, or whether for some there is, whereas for others there is not, and what sorts of beings these are.<sup>262</sup>

[P9] Further, whether the starting-points are definite in number or kind (*eidos*), both those in the accounts and those in the underlying subject.<sup>263</sup>

[P10] Also, whether the starting-points of what passes away and of what does not pass away are the same or distinct, and whether none of them passes away or those of things that pass away do pass away.<sup>264</sup>

[P11] Further, the most difficult one of all and the one involving the most puzzles—whether the one and being are not, as the Pythagoreans and Plato used to say, another thing, but rather the substance of the beings, or whether this is not so but the underlying subject is another thing, which Empedocles says is love, someone else, fire, someone else, water or air.<sup>265</sup>

[P12] Also, whether the starting-points are universal or like particular things.<sup>266</sup>

[P13] Further, whether they are [causes] potentially or actively, and further whether they are [causes] in any other way than as regards movement.<sup>367</sup> For these topics too cause much puzzlement.

[P14] In addition, whether or not numbers, lines, figures, and points are substances of some sort or not, and if they are substances, are they separate from the perceptible ones or components present in them?<sup>368</sup>

For concerning all these not only is it difficult to be in puzzle-free possession of the truth but it is not easy even to go through the puzzles well in the account.

## B 2

[P1] The first, then, concerns the things we mentioned first, namely, whether it belongs to one science or to more than one to get a theoretical grasp on all the kinds (*genos*) of causes. For how could it belong to one science to know the starting-points if these are not contraries?<sup>369</sup>

Further, to many beings not all the starting-points pertain. For in what way can there be a starting-point of movement for immovable things?<sup>370</sup> Or in what way can the nature of the good be such a starting-point, if indeed everything that is good intrinsically and because of its own nature is an end and a cause in this way, namely, that for its sake the other things both come to be and are, and if the end—that is, the for-the-sake-of-which—is an end of some action, and all actions involve movement?<sup>371</sup> So in the case of immovable things this starting-point could not exist, nor could there be any good-itself. That is why in mathematics too nothing is shown through this cause, nor is there any demonstration where the cause is this: “because it is better or worse.” Indeed no one mentions any such thing at all. And so this is why some of the Sophists—for example, Aristippus—used to shower abuse on mathematics, since in the other crafts, even manual ones like carpentry and shoemaking, the cause is always stated in terms of better or worse, whereas the mathematical sciences take no account of good and bad things.<sup>372</sup>

But then if there are *several* sciences of the causes, and a distinct one for each starting-point, which of them should we say is the one we are inquiring into? Or which of those who possess these sciences should we say has the highest degree of scientific knowledge of the object of our inquiry? For it is possible for all the ways of being causes to pertain to the same thing—for example, in the case of a house the source of the movement is the craft or the builder, the for-the-sake-of-which is the

function, the matter is earth and stones, and the form is the account.<sup>273</sup> Based on our earlier determinations about which of the sciences should be called wisdom, there is reason to apply the term to each.<sup>274</sup> For inso-  
 10 far as wisdom is most ruling and most leading, and insofar as, like with handmaidens, for the other sciences ever to contradict it is not just, it is the science of the end and of the good that is of the same sort as wisdom (for other things are for the sake of the end and the good).<sup>275</sup> And insofar as wisdom was determined to be about the primary causes and about what is most scientifically knowable, it is the science of sub-  
 15 stance that must be of the same sort as it.<sup>276</sup> For since people may scientifically know the same thing in many ways, we say that the person who knows what the object is by its being knows it better than the person who knows it by its not being, and of those who know it better some know it better than others, and the person who knows it best is the person who knows what it is, not the person who knows [merely] its quality or quantity or what it can naturally do or have happen to it. Further, in other cases, too, even those of which there are demonstra-  
 20 tions, we think that there is knowledge of each thing when we know what it is—for example, what squaring a rectangle is, namely, that is the finding of a mean, and similarly in other cases.<sup>277</sup> And about comings to be and actions, and about every sort of change, we think there is knowledge when we know the starting-point of the movement; but this is distinct from and opposed to the end, so that it might seem that for each of these causes it belongs to a distinct science to get a theoretic-  
 25 al grasp on it.

[P2] But then about the starting-points of demonstration too, and whether there is one science of them or more than one, there is dispute (by the starting-points of demonstration I mean the common beliefs on the basis of which we all prove things, such as that in every case it is necessary either to affirm or deny, and that it is impossible for some-  
 30 thing at the same time to both be and not be, and any other propositions like that), namely, about whether there is one science of these and of substance or distinct ones, and, if it is not one science, which of the two should be identified with what we are now inquiring into?<sup>278</sup>

Well, for there to be one science of them is not reasonable. For how is it more special to geometry than to any science whatever to comprehend them? So if indeed it belongs to every science alike to comprehend them, but cannot belong to all [as their special subject], then,  
 35 just as it is not special to the others, neither is it special to the one who knows substances to know about them. At the same time, indeed, in what way can there be a science of them? For what each of them in fact is we know even now—at any rate, even the various crafts make use of

them as things that are known. But if there is a demonstrative science concerned with them, there will have to be some hypothesized genus, as well as attributes, on the one hand, and axioms pertaining to them, on the other, since it is impossible for there to be demonstrations of everything.<sup>279</sup> For demonstration is necessarily *on the basis of* some things, *about* a certain subject, and *of* some things. And so it follows that all provable things belong to some one genus, since all demonstrative sciences make use of the axioms.

But then if the science of substance and the science concerned with the axioms are distinct, which of them naturally has more control and is prior?<sup>280</sup> For it is the axioms that are most universal and the starting-points of all things, and if not to the philosopher, then to whom does it belong to get a theoretical grasp on what is true and what is false about them?<sup>281</sup>

[P3] And in general, where substances are concerned, is there one science of all of them or more than one? Well, if there is not just one, to what sorts of substance should we take our science to pertain? On the other hand, it is not reasonable that there should be one of all of them, since then there would be one demonstrative science of all [intrinsic] coincidents—if indeed every demonstrative science gets a theoretical grasp on the intrinsic coincidents of some underlying subject on the basis of the common beliefs.<sup>282</sup> In fact, to get a theoretical grasp on the intrinsic coincidents *of the same genus* on the basis of the same beliefs does belong to the same science.<sup>283</sup> For of *the what about* there is one science and of the *on the basis of which* there is one science too (whether the same one or a distinct one), and so the coincidents are also theoretically grasped either by these sciences or by one composed of them.<sup>284</sup>

[P5] Further, is the theoretical knowledge concerned with substances alone or also with their [intrinsic] coincidents?<sup>285</sup> I mean, for example, if the solid is a sort of substance and so are lines and planes, does it belong to the same science to know these and the [intrinsic] coincidents of each genus, of which the mathematical sciences provide proofs, or to another science?<sup>286</sup> If to the same one, the science of substance would also be a demonstrative science, but there does not seem to be a demonstration of the *what-something-is*.<sup>287</sup> On the other hand, if it belongs to another science, which of them is going to get a theoretical grasp on the [intrinsic] coincidents of substance? This is a very difficult question.<sup>288</sup>

[P4] Further, are we to say that only the perceptible substances exist, or that there are others beyond these? And is there one kind (*genos*) or are there in fact several kinds of these substances—as those say who assert the existence both of the Forms and of the intermediates, with

which they say the mathematical sciences are concerned? Now the way in which we say that the Forms are both causes and intrinsically substances has already been stated in our first accounts of them.<sup>289</sup> But while Forms involve difficulties in many places, none is stranger than to say that there are certain natures beyond those in the heaven as a whole, and that these are the same as perceptibles, except that they are eternal whereas the latter pass away.<sup>290</sup> For they say that there is man-itself and horse-itself and health-itself, and nothing else—like those who introduce gods, but say that they are human in form.<sup>291</sup> For those people were making the gods nothing but eternal human beings, and these are making the Forms nothing but eternal perceptibles.

Further, if beyond the Forms and the perceptibles someone is going to posit the intermediates, he will face many puzzles. For it is clear that there will be lines beyond the lines-themselves and the perceptible lines, and similarly with each of the other kinds (*genos*). So if indeed astronomy is one of the mathematical sciences, there will also be a heaven beyond the perceptible heaven, as well as a sun and a moon, and similarly with the other bodies throughout the heaven.<sup>292</sup> And yet how are we supposed to believe these things?<sup>293</sup> For a thing of that sort to be immovable is not reasonable, but for it to be moving is altogether impossible. Similarly too for the things that optics busies itself with and those in harmonics, since it is impossible—due to the same causes—for them to be beyond the perceptibles.<sup>294</sup> For if there are intermediate perceptibles and perceptions, it is clear that there will also be animals that are intermediate between the animals themselves and the ones that pass away.<sup>295</sup>

But someone might also raise this puzzle: with reference to which sorts of beings are we supposed to look for these sciences [of intermediates]? For if geometry is to differ from measurement only in this respect, that measurement is of things we perceive, whereas geometry is not, it is clear that there will also be a science beyond medicine (and beyond each of the others), intermediate between medicine-itself and the medicine for the things that exist here.<sup>296</sup> And yet how is this possible? For there would also have to be healthy things beyond the perceptible ones and the healthy-itself. At the same time, though, not even this is true, namely, that measurement is of perceptible magnitudes that pass away, since it would then pass away when they did.<sup>297</sup>

But then [geometry] would not be concerned with perceptibles, nor would astronomy be concerned with the heaven that is here. For perceptible lines are not the way a geometer says lines are—for no perceptible thing is straight or round in the way he says they are,

since a circular hoop makes contact with a ruler not at a point but as Protagoras used to say it did when refuting the geometers—nor are the movements and spirals of the heaven like those about which astronomy produces its accounts, nor do points have the same nature as stars.<sup>298</sup>

There are some, however, who say that these so-called intermediates between the Forms and the perceptibles exist, although not *separate* from perceptibles but rather in them.<sup>299</sup> To go through all the impossible consequences of these views would require too long an account. It is enough to get a theoretical grasp even on the following ones: It is not reasonable, after all, that this should hold only of the intermediates, rather, it is clear that the Forms too might exist in the perceptibles, since the same argument applies to both of them. Further, it follows that two solid things are necessarily in the same place, and that [the intermediates] are not immovable, since they at any rate are *in* things that are moving—namely, perceptibles. And in general, for the sake of what would someone posit that they exist but that they exist in perceptibles? For the same strange consequences will follow that we have already mentioned, namely, there will be a heaven beyond the heaven, only not separate from it but rather in the same place—which is just what is even more impossible.

## B 3

[P6] Where these issues are concerned, then, there is much puzzlement both about the way we should put things in order to hit on the truth, and about the starting-points, namely, whether it is the genera that we should take to be elements and starting-points or, rather, the primary components present in each thing.<sup>300</sup> For example, the elements and starting-points of voiced sound seem to be those primary things from which voiced sounds are composed, not the common [genus]—voiced sound.<sup>301</sup> And we speak of the elements of diagrams as those things whose demonstrations are present in the demonstrations of the other things, either of all of them or of most.<sup>302</sup> Further, both those who say that there are several elements of bodies and those who say that there is one speak of the things from which a body is composed as starting-points. For example, Empedocles says that fire, water, and the ones that come after these are elements present in beings from which these beings are composed, but does not speak of these as genera of beings. In addition to this, if we also want to examine the nature of other things (for example, a bed), when we know the parts from which it is composed and the way they are put together, then we know its

nature. On the basis of these arguments, then, the genera would not be the starting-points of beings.

On the other hand, insofar as we know each thing through definitions, and the genera are the starting-points of definitions, then the genera must also be the starting-points of the definable things.<sup>303</sup> And if to get scientific knowledge of beings is to get it of the species (*eidos*) in accord with which beings are said [to be what they are], the genera are starting-points at any rate of the species.<sup>304</sup> And some even of those who speak of *the one* or *being* or the great and small as elements of beings apparently treat them as genera.

But then neither is it possible to speak of the starting-points in *both* ways. For the account of the substance is one, whereas the definition by means of genera will be distinct from the definition that states the components present in a thing.<sup>305</sup>

[P7] In addition to this, even if it is the genera that are to the highest degree starting-points, is it the primary genera that we should acknowledge as starting-points or the ultimate ones, which are predicated of the indivisibles?<sup>306</sup> For this too admits of dispute. For if the universal ones are always to a higher degree starting-points, it is evident that the highest of the genera [will be to the highest degree starting-points], since they are said of all things. There will then be as many starting-points of beings as there are primary genera, and so being and the one will be starting-points and substances, since these are to the highest degree said of all beings.<sup>307</sup> But it is not possible that either the one or being should be a single genus of beings. For the differentiae of each genus must each both be and be one, but it is impossible either for the species of the genus to be predicated of their own proper differentiae or for the genus to be predicated without its species.<sup>308</sup> So if indeed the one is a genus or if being is, no differentia will either have being or be one. But then if they are not genera, neither will they be starting-points, if indeed the genera are the starting-points.

Further, the intermediate ones, taken together with the differentiae, will also be genera, down to the indivisible ones, but as things stand some seem to be genera and others do not.<sup>309</sup> In addition to this, the differentiae will be starting-points to a still higher degree than the genera.<sup>310</sup> But if these too are starting-points, then the starting-points become (one might almost say) unlimited in number, especially if we take the primary genus as a starting-point. But then, if the one is, at any rate, to a higher degree the kind (*eidos*) of thing to be a starting-point, and what is indivisible is one thing, and everything that is indivisible is so either in quantity or in species, and what is so in species is prior, and



the genera are divided into species, then the ultimate genus predicated of a thing would be to a higher degree one (for the human is not the *genus* of particular humans).<sup>311</sup>

Further, in the case of things among which there is priority and posteriority, what is over them cannot be something beyond them.<sup>312</sup> For example, if two is the first of the numbers, no number will exist beyond the species of numbers.<sup>313</sup> Nor, similarly, will there be a [geometrical] figure beyond the species of figures. But if not of these things, there will hardly be genera beyond the species of other ones, since of these above all there seem to be genera.<sup>314</sup> (But among the indivisibles, one is not prior and another posterior.<sup>315</sup>) Further, where one thing is better and another worse, the better is always prior, so that of these also there would not be a genus.<sup>316</sup>

On the basis of these considerations, then, the ones predicated of indivisibles appear to be starting-points rather than the [primary] genera. But again, in what way we should take these to be starting-points is not easy to say.<sup>317</sup> For the starting-point, or the cause, must exist beyond the things of which it is a starting-point and must be capable of existing as separated from them.<sup>318</sup> But why should we take any such thing to exist beyond the particular things, besides the fact that it is predicated universally and of all of them? But again if is because of *that*, then we should posit that the more universal ones are starting-points to a higher degree, and so the primary genera would be starting-points.

#### B 4

[P8] Connected with these there is a puzzle, most difficult of all and most necessary to get a theoretical grasp on, to which our account now turns.<sup>319</sup> For if nothing exists beyond the particular things, and the particular things are unlimited in number, how is it possible to get scientific knowledge of unlimited many things? For it is insofar as they are one and the same thing, and insofar as something universal belongs to them, that we know all things.

But then, if this is necessary, and there must exist something beyond the particulars, it will be necessary that the genera exist beyond the particulars—either the ultimate genera or the primary ones. But we just went through a puzzle concerning the impossibility of this.<sup>320</sup> Further, if something exists most of all beyond the compound (I mean by “compound” whenever something is predicated of the matter)—if it exists, is it beyond all of them [that is, all the compound things] that it must exist, or beyond some but not others, or beyond none?

999<sup>b</sup>1 Now if nothing exists beyond the particular things, there will be nothing intelligible, but all will be perceptible, and there will be no scientific knowledge of anything, unless someone says that perception is scientific knowledge.<sup>321</sup> Further, nothing will be either eternal or immovable, since all perceptibles pass away and are in movement. But then, if *nothing* is eternal, neither is it possible for anything to be coming to be. For there must be something that comes to be and something from which it comes to be, and of these the last one cannot have come to be, if indeed there is a stopping point and if coming to be from not being is impossible. Further, if coming to be and movement exist, there must also be a limit. For no movement is unlimited, but every one has an end, and what cannot *come* to be cannot be *coming* to be, and what *has* come to be must *be* at the first moment it has come to be. Further, if indeed the matter exists because it cannot have come to be, it is yet much more reasonable that the substance—the thing that matter is coming to be—should exist. For if neither the substance nor the matter is to exist, nothing at all will exist.<sup>322</sup> And if that is impossible, something must exist beyond the compound, namely, the shape—that is, the form.

Again, though, if we are to posit this, there is a puzzle, namely, in which cases are we to do so and in which not? For that we cannot do so in all cases is evident, since we could not posit a house that is beyond the particular houses. In addition to this, will the substance of all things be one—for example, of all men? But that would be strange, since all those things are one of which the substance is one.<sup>323</sup> But are they many and different? But this too is unreasonable.<sup>324</sup> At the same time, in what way does the matter come to be each of these things, and in what way is the compound both these things?<sup>325</sup>

[P9] Further, where the starting-points are concerned, we might also raise this puzzle. If they are one in form [only], nothing will be one in number, not even the one-itself and being.<sup>326</sup> And how will there be scientific knowing, if there does not exist something that is a one over all?<sup>327</sup>

But then, if they are one in number, that is, if each of the starting-points is one, and not, as in the case of perceptibles, different for different perceptibles (for example, the starting-points of this syllable, which is the same in form [as that], are also the same in form and [not in number], since they belong to syllables that are distinct in number)—if they are not one in the latter way, but instead the starting-points of beings are one in number, nothing else will exist beyond the elements (for whether we say “one in number” or “particular” makes no difference, since by “particular” we mean “one in number,” and by “universal” we mean “what is over particulars”). So it is just like this: if the elements of voiced sound were definite in number, it would be

necessary for all of literature to amount to the number of these elements, since there could not be two or more of the same ones.<sup>328</sup>

[P10] No less a puzzle than any has been passed over both by people now and by previous ones, namely, whether the starting-points of things that can pass away and things that cannot pass away are the same or distinct. For if they are the same, how is it that some things can pass away, whereas others cannot pass away, and due to what cause?<sup>329</sup>

Now the followers of Hesiod and all the theologians thought only of what was persuasive to themselves, but had contempt for people like us. For they made the starting-points to be gods and what is born from gods, and say that those who did not taste nectar or ambrosia became mortal, clearly using terms familiar to themselves. Although about the very *ingestion* of these causes they have spoken over our heads. For if it is for the sake of pleasure that the gods touch these, then nectar and ambrosia are in no way the causes of their being; but if these *are* the causes of their being, how could the gods be eternal, since they need nourishment?<sup>330</sup>

Where mythical subtleties are concerned, to be sure, a serious investigation is not worthwhile, but we should cross-question those who use the language of demonstration to learn from them why in the world from the same things come, on the one hand, beings that are eternal in nature and, on the other, beings that pass away. But since they neither mention a cause nor is it reasonable that things should be this way, it is clear that the starting-points and causes of these things cannot be the same. For even the very person we might think to speak most consistently, namely, Empedocles—even he suffers from the same deficiency. For he posits a starting-point, strife, as a cause of passing away, but this would seem to be no less a cause of coming to be [for everything] apart from the one, since from strife come all the other things except the god. At any rate, he says:

From which all things—those that were, those that are, those that will be hereafter—

Trees, and men and women, took their growth,  
and beasts and birds and water-nourished fish,  
and long-aged gods.<sup>331</sup>

But quite apart from these lines it is clear. For if strife had not been present in things, all things would have been one, as he says. For whenever these come together, “strife was taking a stand at the lastmost place.”<sup>332</sup> That is also why it follows for him that the happiest god is less wise

than the others, since he does not know all things. For he does not have strife [in him], and knowledge is of like by like. "For by earth," he says,

we see earth, by water, water,  
By ether, divine ether,  
By love (*storgē*) love, and strife by baneful strife.<sup>333</sup>

But—and this is the place from which our account began—this at least is evident, that it follows for him that strife is no more the cause of passing away than of being, nor love (*philotēs*) likewise the cause of being, since by bringing the other things together into the one it causes them to pass away. And at the same time he says nothing about the cause of the changeover itself, except that it is naturally that way:

But when great strife was nourished in the limbs [of the sphere],  
He leaped up to claim his office as the time was fulfilled,  
Which had been fixed for their exchange by a broad strong oath,<sup>334</sup>

as if it were necessary for there to be a changeover. But he makes no cause of the necessity clear. Nonetheless, thus far at least he alone does speak consistently. For he does not make some beings capable of passing away and others incapable of passing away, but makes all of them capable of passing away, except the elements. But the puzzle we are now talking about is why one lot is one way and the other the other, if indeed they come from the same starting-points.

So as regards the fact that the starting-points [of the two] cannot be the same, let that much be said. But if there are distinct starting-points, one puzzle is whether these too will be incapable of passing away or capable of passing away. For if they can pass away, it is clearly necessary for these also to come from certain things, since all things that pass away do so into the things they come from. And so it follows that other starting-points are prior to *the* starting-points. But this is impossible, both if the series comes to a stop and if it goes on without limit. Further, what way will things that can pass away be, if their starting-points are to be done away with? On the other hand, if the starting-points cannot pass away, due to what will things that *can* pass away come from *these* things that cannot pass away, whereas from the other ones it is things that *cannot* pass away? For this is not reasonable—on the contrary, either it is impossible or it would require much argument. Further, no one has even tried to posit other starting-points [for the two sorts of things], instead, they say that the starting-points

of all things are the same. But they sidestep the first puzzle as if they took it to be something trivial.

[P11] Of all of the puzzles, however, the one that is most difficult even to get a theoretical grasp on, and the one most necessary for knowledge of the truth, is whether being and the one are really substances of beings, and whether each of them is—not by being another thing—one and being respectively, or whether we must inquire into what being really is and what the one really is on the supposition that some other nature underlies them as subject.<sup>335</sup> For some people think their nature is of the former sort, others of the latter sort. For Plato and the Pythagoreans think that neither being nor the one is another thing, but that *this* is what the nature of each of them is, on the supposition that the substance of it is to be one or to be being.<sup>336</sup> Those concerned with nature, however, [take the latter view]. For example, Empedocles—supposing that he was leading it back to something more familiar—says what the one is. For he would seem to say that love (*philia*) is something of this sort. At any rate, this is for all things the cause of their being one. But other people say that fire, and others that air, is the one and the being in question, from which beings are and have come to be. Those who posit a plurality of elements also hold the same view, since they too must say that the one and being are precisely as many as the starting-points that they say exist.

However, if we do not posit the one and being to be some sort of substance, it follows that none of the other universals exists either, since these are the most universal of all. And if there is not some one-itself and being-itself, there would scarcely be any others that are beyond the so-called particulars. Further, if the one is not substance, it is clear that number would not exist either as a nature separated from the beings. For number is composed of units, and the unit is just what a certain sort of one is. But if there exists some one-itself and being-itself, then one and being must be their substance, since it is not another thing that is predicated of them, but these themselves.

But then if there *is* to be some being-itself and one-itself, there is much puzzlement as to how anything else will exist beyond these—I mean, as to how beings will be more than one. For what is other than being *is not*, and so, according to Parmenides' argument, it necessarily follows that all beings are one, and this one is being. Either way, it is difficult. For whether the one is not substance or whether there is some one-itself, number cannot be substance. We said earlier why this holds if the one is not substance, but if it is substance, the puzzle is the same as that concerning being.<sup>337</sup> For from what, beyond the one-itself, will

5 there be another one? Indeed, it must be not-one. But all beings are either one or a many of which each is one.

Further, if the one-itself is indivisible, according to Zeno's axiom it would be nothing.<sup>338</sup> For what neither makes larger when added nor smaller when subtracted, he says, has no being—on the supposition, clearly, that a being is a magnitude, and that if it is a magnitude, it is corporeal. For body has being in every [dimension], whereas other things—for example, a plane and a line—will make something larger when added in one way, but when added in another way will not do so, but a point and a unit in no way make something larger. But since he gets a theoretical grasp on the matter in a crude way, and it is possible for something indivisible to exist, against him too there is some defense, since something indivisible will not make a larger magnitude by being added, but will make a larger number—still, *how* from a one of the relevant sort, or from several such ones, will a magnitude come? For it is like saying that a line comes from points.

But then, even if we suppose the case to be such that, as some people say, number comes from the one-itself and from something else that is not one, nonetheless we must inquire into why and how what comes to be is sometimes a number and sometimes a magnitude, if indeed the not-one in question was the unequal and was the same nature [in both instances]. For it is clear that there is no way in which magnitudes could come to be from one and this nature, or from some number and this nature.

## B 5

[P14] Following these issues is a puzzle as to whether numbers, bodies, planes, and points are substances or not.<sup>339</sup> For if they are not, then it escapes us what being is and what the substances of beings are. For attributes, movements, relatives, dispositions, and ratios do not seem to signify the substance of anything, since all are said of some underlying subject and none is a *this something*.<sup>340</sup> And as for the things that would seem most of all to signify substance, water and earth and fire and air, from which composite bodies are composed, heat and cold and the like are attributes of these, not substances, and only the body possessed of these attributes persists as a sort of being, that is, a sort of substance. But then body is certainly substance to a lesser degree than surface, surface than line, and line than unit and point. For it is by these that body is defined, and it seems possible for them to exist without body but impossible for body to exist without them.<sup>341</sup> That is why,

while most thinkers and the earlier ones thought that substance and being were body and that other things were attributes of this, so that the starting-points of bodies were also the starting-points of beings, later and seemingly wiser thinkers thought that these were numbers.<sup>342</sup> As we said then, if these are not substances, there is no substance or being at all—for the coincidents of these, at any rate, certainly do not deserve to be called *beings*.

But then, if it is agreed that lines and points are substance to a higher degree than bodies, but we do not see to what sort of bodies they might belong (for it is impossible for them to be in perceptible ones), then no substance would exist at all.<sup>343</sup> Further, it is evident that all these things are divisions of bodies—one in breadth, one in depth, one in length.

In addition to these, any shape whatever is present in the solid in the same way, or else none at all is. Thus if Hermes is not present in the stone, neither is the half of the cube present in the cube as something definite; therefore neither is the surface, since if any surface whatever were present, so too would be the surface that determines the half. And the same argument also applies to line, point, and unit. Thus if body is in the highest degree substance, and these divisions are so more than body is, but these do not exist nor are they certain substances, then it escapes us what being is, and what the substance of beings is.<sup>344</sup>

In addition to what has been said, the consequences that follow where coming to be and passing away are concerned are unreasonable. For it seems that substance, whether it did not exist earlier but does exist now or existed earlier but does not exist later, undergoes these through coming to be and passing away. But points, lines, and surfaces neither admit of a process of coming to be nor of passing away, though at one time they exist and at another do not. For when bodies make contact or are divided, at one time (when they make contact) there immediately comes to be one surface, whereas at another time (when they are divided) there immediately come to be two, so that when they are put together their surfaces do not exist, but have passed away, whereas when they are divided, surfaces exist that did not exist earlier (for it certainly is not that an indivisible point has been divided into two). And if they come to be and pass away, from what do they come to be? The case is also quite similar to that of "the now" in time, since it does not admit of coming to be or passing away either, yet it seems to be always something distinct nevertheless, because it is not a sort of substance.<sup>345</sup> It is clear that it is similar where points, lines, and planes are concerned. The argument is the same, since they are in a similar way either limits or divisions.

## B 6

[P14a] And we might in general raise the puzzle as to why it is even necessary to look for other things beyond perceptibles and intermediates, such as the Forms that we posit.<sup>346</sup> For suppose it is because of this, namely, that the objects of mathematics, while they differ from the things we find around here in some other respect, in there being many of the same form they do not differ at all, so that their starting-points will not be definite in number (just as the starting-points of the writings that exist here are not definite in number either, although they are so in form—provided we do not take the starting-points of this syllable here or of this voiced sound here, since of these the starting-points will be definite in number as well—and similarly too in the case of the intermediates, since things of the same form are unlimited in number there as well).<sup>347</sup> Thus if there are not, beyond perceptibles and the objects of mathematics, other things such as some people say the Forms are, there will not be substance that is one in number, but in form, nor will the starting-points of beings be so-and-so many in number, but in form.<sup>348</sup> Accordingly, if this is necessary, it is also necessary because of it to posit that the Forms exist. For even if those who say this do not articulate it well, still this is what they mean at least, and it is necessary for them to say these things, because each of the Forms is a sort of substance and none exists coincidentally.

But then, if we *are* to posit both that the Forms exist and that the starting-points are one in number, not in form, we have said what impossibilities necessarily follow.<sup>349</sup>

[P13] Closely connected with these topics is going through the puzzles about whether the elements are [causes] potentially or in some other way.<sup>350</sup> For if it is in some other way, something else will be prior to the starting-points (for the capacity is prior to that other cause, and not all of what is capable of being in a certain way is in that way).<sup>351</sup> But if the elements are [causes] potentially, it is possible that none of the other beings should exist.<sup>352</sup> For even what is not yet has the potentiality to be, since what is not [yet] does come to be, whereas none of the things that lack the potentiality to be comes to be.

[P12] So we must go through both these puzzles about the starting-points and ask whether they are universal or exist in the way we say particulars do. For if they are universal, they will not be substances. For no common thing signifies a this something but a such-and-such sort of thing, whereas substance is a this something.<sup>353</sup> And if we are to posit that what is predicated in common is a this something and can be set out, then Socrates will be many animals: himself and the human



and the animal—if indeed each of these signifies a this something and one thing.<sup>354</sup>

If then the starting-points are universals, these things follow. But if they are not universals, but [exist] as particulars, they will not be scientifically knowable. For scientific knowledge of all things is universal. Thus there will be other starting-points prior to *the* starting-points, namely, those that are predicated universally, if indeed there is going to be scientific knowledge of these.

15

## BOOK GAMMA (IV)

### Γ 1

20 There is a science that gets a theoretical grasp on being qua being  
and of the [coincident] belonging intrinsically to it.<sup>355</sup> But this is not  
the same as any of the so-called special sciences, since none of these  
investigates being qua being in a universal way. Rather, each cuts off  
25 a part of being and gets a theoretical grasp on what is an [intrinsic]  
coincident of that—as, for example, the mathematical sciences do. But  
since we are inquiring into the starting-points and the highest causes,  
clearly these must be the starting-points and causes of some nature as  
it is intrinsically.<sup>356</sup> So if those who were inquiring into the elements of  
30 beings were inquiring into these same starting-points, it is necessary  
that the elements too be elements of being not coincidentally but qua  
being. That is why it is of being qua being that we too must grasp the  
primary causes.

### Γ 2

Something is said to be in many ways, however, but with reference to  
one thing and one nature—that is, not homonymously.<sup>357</sup> Rather, just  
as what is healthy all has reference to health, one by safeguarding it,  
35 another by producing it, one by being an indication of health, another  
because it is a recipient of it, and what is medical all has reference to the  
craft of medicine (for one thing is said to be medical by possessing the  
craft of medicine, another by being naturally well disposed to it, another  
by being a result of the craft of medicine), and we shall find other things  
that are said to be in ways similar to these, so, too, something is said  
5 to be in many ways, but all with reference to one starting-point.<sup>358</sup> For  
some things are said to be because they are substances, others because  
they are attributes of substances, others because they are a route to sub-  
stance, or else by being passings away, lacks, or qualities of substance, or  
productive or generative either of substance or of things that are said to  
be with reference to substance, or denials of one of these or of substance  
10 (that is why we say even of not being that it is not being).<sup>359</sup>

And so just as of all healthy things there is one science, so it is in  
the case of the others as well.<sup>360</sup> For not only in the case of things that  
are said to be in accord with one thing does it belong to one science

to get a theoretical grasp on them, but also in the case of things that are said to be with reference to one nature, since even these are in a way said to be in accord with one thing.<sup>361</sup> So it is clear, in the case of beings too, that it belongs to one science to get a theoretical grasp on them qua beings. In every case, however, a science in the fullest sense is of what is primary, and of what the other things are based on, and because of which they are said to be. So if this is substance, it will be of substances that the philosopher must possess the starting-points and causes.

Of every one genus (*genos*) there is both one perception and one science—for example, grammar, which is one science, gets a theoretical grasp on all voiced sounds.<sup>362</sup> That is why to get a theoretical grasp on all the sub-kinds (*eidos*) of being qua being belongs to a science that is one in kind (*genos*), and to the sub-kinds (*eidos*) of it to get such a grasp on the sub-kinds (*eidos*).

Being and one are the same and one nature, in that they follow along with each other, just as starting-point and cause do, but not in that they are made clear by one account (although it makes no difference if we do take them like that, instead it in fact helps with our work).<sup>363</sup> For *one human* and *a human who is* and *a human* are the same thing, and no other thing is made clear by an expression that uses two of them, "He is a human and a human who is."<sup>364</sup> On the contrary, it is clear that the two are separated neither in coming to be nor in passing away, and similarly in the case of being one.<sup>365</sup> And so it is evident that the addition in these cases makes the same thing clear, and that being one is nothing beyond being. Further, the substance of each thing is one in no coincidental way, and likewise is just a certain sort of being.<sup>366</sup>

So there are as many sub-kinds (*eidos*) of being as there are of being one, and to get a theoretical grasp on the what-it-is of each of them belongs to a science that is one in kind (*genos*)—I mean, for example, on same, similar, and other such things. Pretty much all of the contraries are referred back to this starting-point. The theoretical grasp we got on these in the "Selection of Contraries" may suffice.<sup>367</sup>

And there are as many parts of philosophy as there are [sub-kinds] of substances, and so it is necessary for there to be a primary philosophy among them and one that follows this.<sup>368</sup> For being and being one fall straightaway into kinds (*genos*), which is why the sciences will follow these.<sup>369</sup> For a philosopher is said to be what he is just like a mathematician, since mathematics also has parts, and there is a first and a second science and other successive ones within mathematics.<sup>370</sup>

But since it belongs to one science to get a theoretical grasp on opposites, and being many is opposed to being one (and to get a theoretical grasp on the denial and the lack belongs to one science, because in both cases we are getting a theoretical grasp on the one thing of which it is the denial or the lack, since we either say that unconditionally it does not belong or that it does not belong to some genus, and in the latter case the differentia is present beyond what is in the denial, for the denial is [just] the thing's absence, and in the case of the lack a certain nature is also involved that is the underlying subject of which it is said), and [to repeat] being many is opposed to being one, so that to know the opposites of the things we mentioned—other and unlike and unequal, and everything else that is said to be either in accord with these or in accord with being many and being one—belongs to the science we mentioned.<sup>371</sup>

But contrariety is also one of these. For contrariety is a sort of difference, and difference a sort of distinctness. So, since things are said to be one in many ways, these things will all be said to be in many ways. Nonetheless, it belongs to one science to know all of them. For it is not when they are said to be in many ways that knowing all of them belongs to distinct sciences, but when they are neither said in accord with one thing nor is there one thing to which their accounts are referred back. But since all things are referred back to what is primary, (as, for example, all things that are said to be one are referred back to what is primarily one), this is also what we should say holds of same, other, and contraries generally. And so after determining the number of ways in which something is said to be each of them, we then have to explain, by reference to what is primary in each predication, the way things are said to be in relation to *that*. For some things will be said to be by possessing it, some by producing it, others in other such ways.

It is evident, then, that it belongs to one science to have an account of these as well as of substance (which was one of the very puzzles we mentioned), and that it belongs to the philosopher to be able to get a theoretical grasp on all of them.<sup>372</sup> For if it does not belong to the philosopher, then who will be the investigator of whether Socrates and Socrates seated are the same, or whether one thing has one contrary, or what a contrary is, or in how many ways something is said to be a contrary? And similarly with other questions of that sort. So, since these things are intrinsic attributes of being one qua being one and of being qua being, and not qua being numbers or lines or fire, it is clear that it belongs to that science to know both what each of them is and also their [intrinsic] coincidents.<sup>373</sup> And the error made by those who investigate these questions is not that they are not doing philosophy, but that substance is a topic about which they comprehend nothing.

For just as of number qua number there are special attributes (for example, oddness, evenness, commensurability, equality, excess, deficiency), and these belong to all numbers either intrinsically or in relation to each other (and similarly there are other special attributes of what is solid, of what is immovable, of what is moving, of what is weightless, and of what has weight), so too there are certain special attributes of being qua being, and it is about these that it belongs to the philosopher to investigate the truth.<sup>374</sup>

An indication of this is that dialecticians and sophists in fact cut the same figure as the philosopher. For sophistic is only apparently wisdom, and dialecticians discuss all [these] things, and being is common to all [these], but clearly they discuss them because they properly belong to philosophy.<sup>375</sup> So sophistic and dialectic are indeed concerned with the same kind (*genos*) as philosophy, but philosophy differs from dialectic in the way its capacity is employed, and from sophistic in the life it deliberately chooses.<sup>376</sup> For dialectic employs peirastic about the issues philosophy seeks to know about, while sophistic appears to be knowledge but is not.<sup>377</sup>

Further, one of the two columns of contraries is a lack, and all of them are referred back to being and not being, and of being one and being many (as, for example, being at rest belongs with being one, moving belongs with being many). And pretty much everyone agrees that beings and substance are composed of contraries; at any rate, they all say that the starting-points are contraries. For some say that they are odd and even, some that they are hot and cold, some that they are limited and unlimited, some that they are love (*philia*) and strife. And all the others are evidently also referred back to being one and being many (let us take this referring back as established), and the starting-points posited by other thinkers also fall completely under one and many as their kinds (*genos*).<sup>378</sup>

So it is evident from these considerations too that it belongs to one science to get a theoretical grasp on being qua being. For all things either are or are derived from contraries and the starting-points of contraries are being one and being many.<sup>379</sup> And these belong to one science, whether they are said in accord with one thing or are not said in accord with one thing (which is presumably in fact the truth). Nonetheless, even if things are said to be one in many ways, the others will be said to be one with reference to the first, and contraries similarly. And because of that—and if being or the one is not a universal and the same over all things or separable, as presumably it is not, but some things are said to be or to be one with reference to one thing, others in virtue of succession—and because of that [to repeat], it does not belong to the geometer to get a theoretical grasp on what a contrary

is, or what completeness is, or what being or being one is, or same or other, except on the basis of a hypothesis.<sup>380</sup>

It is clear, then, that it does belong to one science to get a theoretical grasp on being qua being, and on the attributes that it has qua being, and that the same science will get a theoretical grasp not only on substances but also on their attributes, both the aforementioned ones and prior and posterior, genus and species, whole and part, and others of this sort.

## Γ 3

We do, however, have to say whether it belongs to one science or to distinct ones to get a theoretical grasp both on what in mathematics are called "axioms" and on substance.<sup>381</sup> It is evident, then, that the investigation of these does also belong to one science and, besides, that the one in question is the philosopher's. For these axioms hold of all beings, and not of some special genus separate from the others. Also, because they are true of being qua being and each genus is a genus of being, all people do use them. However, they use them only so far as is adequate for their purposes, that is, so far as the genus extends about which they are carrying out their demonstrations.

So, since it is clear that these axioms hold of all things qua beings (for this is what is common to them), it belongs to the person who knows being qua being to get a theoretical grasp on them as well. That is why none of those who investigate a part [of being]—neither geometer nor arithmetician—attempts to say anything about them, as to whether or not they are true. But some natural scientists, as makes perfect sense, did do this, since they were the only ones who thought that they were both investigating nature as a whole and investigating being. But since there is someone further, higher than the natural scientist (for nature is one particular kind (*genos*) of being), it will belong to him whose theoretical grasp is universal and concerned with primary substance also to investigate these axioms.<sup>382</sup> Natural science, however, is a sort of wisdom too, but it is not the primary sort.<sup>383</sup>

As for the attempts of some of those who speak about the truth, as to the way in which it should be accepted, they do this because of a lack of educatedness in analytics.<sup>384</sup> For people should come with prior scientific knowledge of analytics, not look for it while listening [to lectures in the science they are learning].

It is clear, then, that it belongs to the philosopher—that is, to the one who gets a theoretical grasp on the nature of all substance—also to investigate the starting-points of deductions. And it is fitting for

the one who knows best about each kind (*genos*) to be able to state the most stable starting-points of his subject matter, and so when this is beings qua beings, the most stable starting-points of all things. And this person is the philosopher. The most stable starting-point of all, however, is the one it is impossible to be deceived about.<sup>385</sup> For such a starting-point must be both the best known—since it is things that people do not know that they can all be fooled about—and unhypothetical.<sup>386</sup> For a starting-point that must be possessed by anyone who is going to apprehend *any* beings is no hypothesis. And what someone must know who knows anything at all, he must already possess. It is clear, then, that such a starting-point is the most stable of all. 10 15

What it is, however, we must next state. It is: that the same thing cannot at the same time belong and also not belong to the same thing and in the same respect (and let us assume that we have also added as many other qualifications as might be needed to respond to logico-linguistic difficulties).<sup>387</sup> This, then, is the most stable of all starting-points, since it has the aforementioned distinguishing feature. For it is impossible for anyone to take the same thing to be and not to be, as some people think Heraclitus says.<sup>388</sup> For it is not necessary for what someone says to be what he takes to be so. But if it is not possible for contraries at the same time to belong and not belong to the same thing (and let us assume that the usual qualifications have been added to this proposition too), and if what is contrary to a belief is the belief in its contradictory, then it is evident that it is impossible for the same person at the same time to take the same thing to be and not to be, since a person who has false views on this point would hold contrary beliefs at the same time.<sup>389</sup> That is why all who are carrying out a demonstration lead it back to this as an ultimate belief, since this is by nature the starting-point of all the other axioms too.<sup>390</sup> 20 25 30

## Γ 4

But there are some people who, as we said, themselves assert both that it is possible for the same thing to be and not to be and also to take this to be so. Many even of those concerned with nature make use of this claim.<sup>391</sup> But we have just taken it to be impossible for anything at the same time to be and not to be, and by means of this we have shown that it is the most stable of all starting-points.<sup>392</sup> 35 1006<sup>b</sup>

Now some people do demand that we demonstrate even this, but this is due to lack of educatedness.<sup>393</sup> For it is lack of educatedness not 5

to know what things we should look for a demonstration of and what things we should not. For it is in general impossible to demonstrate everything (for it would go on without limit, so that even then there would be no demonstration). But if there are things we should not look for a demonstration of, these people would not be able to say what starting-point they think has more of a claim to be such.

There is, however, a demonstration by refutation even that this view [that we started with] is impossible, if only the disputant says something.<sup>394</sup> But if he says nothing, it is ridiculous to look for an argument against someone who has an argument for nothing, insofar as he has none. For such a person, insofar as he is such, is like a vegetable. And by "demonstrating by refutation" I mean something different from demonstrating, because in demonstrating we might seem to be assuming the starting-point at issue, but if the other person is responsible for an assumption of this sort, it would be refutation not demonstration.

The starting-point for all such arguments is to ask the disputant not to *state* something to be or not to be (since someone might take this to be assuming the starting-point at issue), but rather to *signify* something both to himself and to another person, since that is necessary if indeed he is to say something.<sup>395</sup> For if he does not grant this, no argument is possible for such a person, either with himself or with another. But if he does grant it, demonstration will be possible, since there will already be something definite. The one responsible for it, however, is not the one who gives the demonstration but the one who submits to it, since in doing away with argument, he submits to argument. Further, anyone who agrees to this has agreed that something is true without a demonstration, so that not everything will be so-and-so and not so-and-so.<sup>396</sup>

[A1] First, then, this at least is clearly true: the name [agreed to signify something by the disputant] signifies is or is not this, so that not everything will be so-and-so and not so-and-so.<sup>397</sup>

[A2a] Further, if "the human" signifies one thing, let this be *the two-footed animal*.<sup>398</sup> I mean by "signifying one thing" that if human is this, then insofar as anything is human, this will be the being for human.<sup>399</sup> But even if someone were to say that the name involved signifies more than one thing, it makes no difference, provided that these were definite, since to each account a distinct name could be assigned. I mean, for example, if someone were to say that "the human" signified not one thing but several things, and the account of one of these was "the two-footed animal," although there were also several other accounts of it, but a definite number of them. For a special name could be assigned to



each account. If, however, he did not assign that way, but instead said that "the human" signified an unlimited number of things, it is evident that no argument would be possible [with him].<sup>400</sup> For not to signify one thing is to signify nothing, and if names do not signify, discussion with others is done away with, as in truth it is even with ourselves.<sup>401</sup> For it is not possible even to understand without understanding one thing.<sup>402</sup> On the other hand, if it is possible, then one name could be assigned to this thing.

Suppose then, as we said at the start, that the name signifies something, and that it signifies one thing. It is not, then, possible that "the being for human" should signify just what is not being for human, if "the human" signifies not only about one thing but also one thing.<sup>403</sup> For we do not think that this is what it is to signify one thing, namely, to signify about one thing. For *that* way even "the musical" and "the pale" and "the human" would signify one thing, and so all would be one, since they would be synonymous.<sup>404</sup>

Also, it will not be possible to be and not to be the same thing except homonymously—as if what we call "human" others were to call "not human." But the puzzling thing is not this, namely, whether it is possible for the same thing at the same time to be and not be human in name, but whether it is possible for it to be so in fact. If, however, "the human" and "the not human" do not signify distinct things, it is clear that neither will "the not being for human" signify something distinct from "the being for human," and so the being for human will be the not being for human, since they will be one thing (for "to be one thing" signifies this: to be like mantle and cloak, if their account is one). But if they are one thing, then "the being for human" and "the being for not human" will signify one thing. It has been shown, however, that they signify distinct things.<sup>405</sup> Therefore, if it is true to say of something that it is human, then it is necessary for it to be two-footed animal, since this is what "the human" signified. And if that is necessary, then it is not possible for the same thing not to be at that time the two-footed animal (for "necessary for it to be" signifies this: that it is impossible for it not to be). Hence it is not possible at the same time for it to be true to say that the same thing is human and is not human.

[A2b] And the same argument also applies in the case of not being human. For "the being for human" and "the being for not human" signify distinct things, if indeed even "to be the pale" and "to be the human" signify distinct things. For the former are much more opposed, and so signify something distinct. But if the disputant says that "the pale" too signifies one and the same thing as "the human," we will say just the same as we said before, namely, that all—and not only

opposites—will be one. But if that is not possible, what we have stated follows, if he will answer what he is asked.

But if, when he is asked the question unconditionally, he adds the denials as well, he is not answering the question asked. For there is nothing to prevent the same thing from being human and pale and a thousand other things. Nonetheless, since the question was whether it is true to say that this thing is human or not, the answer should signify one thing and not add that it is also pale and large. And in fact it is impossible to go through all its coincidents, which are unlimited in number. So he should go through either all or none. Similarly, therefore, even if the same thing is a thousand times human and not human, he should not, in answering the question whether it is human, add that it is at the same time also not human, unless he is to add the other coincidents too, those that it is and that it is not. But if he does that, he is not engaged in discussion.

[A2c] And in general those who say this do away with substance and essence. For it is necessary for them to say that all are coincidents and that there is no such thing as just the being for human or just the being for animal.<sup>406</sup> For if anything is to be just [the] being for human, this will not be [the] being for not human or [the] not being for human (and yet these are its denials).<sup>407</sup> For what was signified was one thing, and this was something's substance. But to signify the substance of something is to signify that the being for it is no other thing. But if for it to be just the being for human is either for it to be just the being for not human or just the not being for human, it will be some other thing, so that it is necessary for them to say that this sort of account applies to nothing, but that all are coincidental. For substance and coincident are distinguished by this: the pale coincides with the human because he is pale but not just [what] pale [is].

But if everything is said coincidentally, there will be no primary thing that they are said of, if a coincident always signifies a predication of some underlying subject. Hence it is necessary for predication to go on without limit; but that is impossible, since no more than two things can be combined in predication. For a coincident does not coincide with a coincident, unless it is because both coincide with the same subject. I mean, for example, that the pale is musical and the musical is pale, because both coincide with the human.<sup>408</sup> But it is not the case that Socrates is musical in that way, namely, that both [he and it] coincide with some other thing. Accordingly, since some things are said coincidentally in the former way, others in the latter, those said in the way in which the pale coincides with Socrates cannot form an unlimited series in the upward direction (so that, for example, of

pale Socrates some other thing is a coincident), since no one thing comes about from all of them.<sup>409</sup> Nor indeed will another thing—for example, the musical—be a coincident of the pale, since it no more coincides with the pale than the pale does with it. At the same time too what coincides in this way has been distinguished from what coincides in the way in which the musical coincides with Socrates. But in cases of the latter sort the coincident does not coincide with a coincident, although in those of the former sort it does, so that not everything will be said coincidentally. Even [when things are said] in this way, then, there will be something signifying substance. And if that is so, it has been shown that contradictories cannot be predicated at the same time.

[A3a] Further, if contradictories are all true of the same thing at the same time, it is clear that all will be one.<sup>410</sup> For the same thing will be a trireme and a wall and a human, if it is possible either to affirm or deny something of all of them, as those who give the argument of Protagoras must do.<sup>411</sup> For if a human is believed by someone not to be a trireme, then clearly he is not a trireme—and so, he also is a trireme, if indeed the contradictory is true. Indeed, we also, then, get the view of Anaxagoras, that all things were together, so that there is nothing that is truly one.<sup>412</sup> It is about the indefinite, then, that they would seem to be speaking, and while they think they are speaking about being, they are really speaking about not being. For it is potential being but not actual being that is indefinite.<sup>413</sup>

But then they must at least affirm or deny everything of everything. For it would be strange if to each thing its denial belonged, while the denial of some other thing, which does not belong to it, did *not* belong to it. I mean, for example, that if it is true to say of a human that he is not a human, it is clear that he is both a trireme and not a trireme. So if the affirmation belongs, the denial does too. But if the affirmation does not belong to him, at least the denial belongs to him more than his own denial does. So if even the latter belongs to him, the denial of trireme will belong to him too; and if it does, the affirmation of it will as well.

[A3b] And not only does this follow for those who give this argument, but it also follows that it is not necessary either to affirm or deny.<sup>414</sup> For if it is true that he is a human and not a human, it is clear that he will also be neither a human nor not a human. For of the two there are two denials, but if one is composed of the former two, it will also be opposed by one.<sup>415</sup>

[A4] Further, either this applies to all of them, and a thing is both pale and not pale, both being and not being, and similarly for all other

affirmations and denials, or it does not do so, but applies to some and does not apply to others. And if it does not apply to all, these could be agreed on. But if it does apply to all, then once again either the denial will belong wherever the affirmation does and the affirmation will belong wherever the denial does, or else the denial will belong wherever the affirmation does but the affirmation will not always belong where the denial does. [A4a] And if the latter is the case, there will be something that is assuredly *not* being, and this will be a stable belief. And if not being is something stable and knowable, the opposite affirmation will be more knowable. [A4b] But if anything denied can also equally well be affirmed, then necessarily either it is true to divide and say, for example, that a thing is pale and, in turn, to say that it is not pale, or it is not true. [A4b-i] But if it is not true to divide and say this, then he is not really saying these things and nothing whatever has being. (How, though, could things that do not have being walk and talk?) Also, all things will be one, as we said earlier, and the same thing will be human and god and trireme and the denials of these (for if they belong in the same way to each thing, one thing will in no way differ from another, since if it did differ, that would be true and special to it). [A4b-ii] Similarly, even if it is possible to divide and speak truly, what we have said still follows, and in addition everyone will speak truly and everyone will speak falsely, and so the disputant will speak falsely by his own admission.

At the same time it is evident that in response to this person there is nothing for an investigation to be about, since he says nothing. For he says neither that it is so-and-so nor that it is not so-and-so, but that it both is so-and-so and is not so-and-so; and then again he denies both of these, saying that it is neither so-and-so nor not so-and-so. For if he did not, something would already be definite.

[A5] Further, if whenever an affirmation is true, its denial is false, and whenever it is true, the affirmation is false, it will not be possible both to affirm and to deny the same thing truly at the same time. (But presumably disputants might say that this was the very point at issue from the start.)

[A6] Further, is someone who takes it that something is some way, or that it is not some way, speaking falsely, while someone who takes it that it is both is speaking truly? For if the latter is speaking truly, what can be meant by saying that the nature of beings is like that? But if he is not speaking truly, but is speaking more truly than someone who takes it in the former way, then beings will already be in some way, and this will be true and not at the same time also not true. And if all

10 speak both falsely and truly to the same degree, there will be nothing for a person in that condition to utter or say. For at the same time he says this and also not this. And if he takes nothing to be so, but instead thinks and does not think to the same degree, how would his state be any different from a vegetable's?

From this too it is entirely evident that no one—whether other people or those who give this argument—is in fact disposed in this way. For why does someone walk to Megara instead of staying where he is, when he thinks he should walk there?<sup>416</sup> Why does he not early one morning march straight into a well or into a ravine, if one happens to be about, instead of taking evident care to avoid doing so, as if he were someone who is *not* to the same degree thinking that it is not good to fall in and that it is good?<sup>417</sup> Hence it is clear that he takes one thing to be better and that the other not better. And if this is so, he must also take one thing to be human and another not human, one thing sweet and another not sweet. For he does not look for and take all things to be equally so (for if he thinks it is better to drink water and to see a human, he proceeds to look for these things), and yet he *should* do so, if the same thing were to the same degree human and not human. But, just as we said, there is no one who does not take evident care to avoid some things and not others, so that, as it seems, everyone takes something to hold unconditionally, if not about all things, then about what is better and worse. And if this is not scientific knowledge but belief, they should be all the more concerned about the truth, just as someone who is sick should be more concerned about health than someone who is healthy. And indeed someone who has beliefs, when compared to someone who has scientific knowledge, is not in a healthy condition in relation to truth.<sup>418</sup>

[A7] Further, however much all things may be so-and-so and not so-and-so, still there is certainly a more and less present in the nature of beings. For we would not say that two and three are to the same degree even, or that someone who thought that four things were five and someone who thought they were a thousand were to the same degree deceived. If, then, they are not these things to the same degree, it is clear that one of them is such to a lesser degree, and so is more true. So if what is more is closer, then there must be something true to which the more true is closer. And even if there is not, at any rate there is already something more secure and more truth-like, and we shall have set ourselves free from the extreme version of the argument that prevents us from having anything definite in our thought.

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## Γ 5

The argument of Protagoras also derives from the same belief, and both alike must be either true or untrue.<sup>419</sup> For if all the things that seem to be so and all the appearances are true, everything must at the same time be true and false.<sup>420</sup> For many people take things to be so that are contrary to those taken to be so by others, and think that people who do not believe what *they* believe are deceived, so that it is necessary for the same thing to be and also not to be. And if that is the case, then the things that seem to be so must all be true. For those who believe falsely and those who believe truly believe opposite things from each other. So if beings are the relevant way, everyone will believe truly. It is clear, then, that both arguments derive from the same line of thought.

But the same way of inquiry should not be used in response to all the disputants we encounter, since some need persuasion, others force.<sup>421</sup> For the ignorance of those who take this to be so because they were puzzled is easily cured, since the reply to them is directed not at the argument but at the line of thought [behind it]. Those, on the other hand, who state it for the sake of argument must be cured by refutation of the argument as expressed in their speech and their words.

Those who are genuinely puzzled come to this belief from perceptibles. [1] They believe that contradictories and contraries belong to things at the same time because they see contraries coming to be from the same thing. So if it is not possible for what is not to come to be, the thing in question must have previously been both alike. And as Anaxagoras says, "everything is mixed in everything," and also Democritus, since he says that the void and the full belong alike to every part whatever, and yet one of these is being and the other not being.<sup>422</sup> In response to those, then, who take what they take to be so on this basis, we shall say that in one way they speak correctly but in another way they speak in ignorance. For things are said to be in two ways, so that in one way it is possible for something to come to be from not being, whereas in another way it is not, and for the same thing at the same time to be and not to be, although not in the same way. For it is possible for contraries to potentially belong to the same thing at the same time, but not to do so actually. Further, we shall require them to take it that among beings there is also another sort of substance to which neither movement nor passing away nor coming to be at all belongs.<sup>423</sup>

[2] Similarly, too, some have come to believe in the truth of appearances on the basis of perceptibles.<sup>424</sup> For they think it inappropriate to discern the truth by the large or small number [of people who believe it], but that the same thing seems sweet to some who taste it, bitter to

others, so that if all were sick or bereft of thought, while two or three were healthy or possessed of understanding, it is these who would seem to be sick and bereft of thought and not the others. Further, many of the other animals have appearances contrary to ours concerning the same things, and even for each one of us, relative to himself, the same things do not always seem the same to perception. Which, then, of these appearances is true or false is unclear. For the one lot is no more true than the other lot, but rather equally so. That is why Democritus, at any rate, says that either there is no truth or that to us at least it is unclear.

In general, however, it is because they take perception to be thought, and take it to be an alteration, that they say that what appears to perception must of necessity be true.<sup>425</sup> For it is on the basis of these views that both Empedocles and Democritus and (one might almost say) all the others have been captivated by beliefs of this sort. And Empedocles in fact says that people who change their state change their wisdom:

For cunning increases in men in relation to what is present to their senses.

And elsewhere he says that:

To the extent they change over to become altered, to that extent they always find

Their thinking too presenting other things.<sup>426</sup>

And Parmenides expresses himself in the same way:

For as at each moment is the mixture of their much wandering parts,

So is understanding present in men. For the same thing

Is just what does the thinking, namely, the nature of his parts,

In each and every human. For what predominates is what is understood.<sup>427</sup>

A saying of Anaxagoras to some of his companions is also recorded, that "things would be for them as they took them to be." People say that even Homer evidently held this belief, because he made Hector, when he was stunned by a blow, lie there "thinking altered thoughts," as if even those bereft of thought are thinking, but not the same thoughts.<sup>428</sup> So it is clear that if both are states of thinking, then beings will be so-and-so and not so-and-so at the same time. And it is insofar as this is so that the consequences are most difficult. For if those who have seen as much of the truth as is possible for us (and these are the ones who look for it the most and love it the most)—if they hold beliefs of this

sort and express these views about the truth, how can we expect beginners in philosophy not to lose heart? For to look for the truth would be a wild goose chase.

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What caused these people to hold this belief, however, was that while investigating the truth about beings, they took the only beings to be the perceptible ones, and in these there is much of the nature of the indefinite—that is, of the sort of being we described.<sup>429</sup> That is why, though they speak in a perfectly sensible way, they do not speak truly. (For it is more fitting to put the matter like that than as Epicharmus put it against Xenophanes.<sup>430</sup>) Further, seeing that all this sort of nature is in movement, and that about what is changing nothing true can be said, they concluded that about what is in every respect and in every way changing, at any rate, it is not possible to grasp the truth. For it was this supposition that blossomed into the most extreme of the beliefs we have mentioned, that of the declared Heracliteanizers. This was also the sort held by Cratylus, who in the end thought that he should say nothing, but instead only moved his finger, and criticized Heraclitus for saying that it is not possible to step into the same river twice, since he thought that we could not do so even once.<sup>431</sup>

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We, however, in response to this argument too shall say that while they do have some argument for thinking that what is changing, when it is changing, is *not*, yet even *this* is disputable. For what is losing something has some of what is being lost, and of what is coming to be, something must already be.<sup>432</sup> And in general if something is passing away, there will be something that it is, and if something is coming to be, there must be something from which it comes to be and something by which it is generated, and this does not go on without limit. But leaving that point aside, we may say this, that it is not the same thing to change in quantity and to change in quality.<sup>433</sup> Granting, then, that a thing's quantity does not remain what it was, still it is by its form [not its quantity] that we know each thing.

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Further, those who took this to be so could fairly be criticized for asserting about the whole of the heaven what they saw only in a minority even of perceptibles.<sup>434</sup> For the region of the perceptible realm around us is the only one that remains in a permanent process of coming to be and passing away. But this is (one might almost say) not even a fraction of the whole, so that it would be more just to acquit this portion because of the other than to condemn the other because of it.

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Further, it is clear that we shall also say in response to these people what we said before, since it must be shown to them, and they must be persuaded, that there is a certain nature that is immovable.<sup>435</sup> Indeed, to say that things at the same time are and are not is to imply that all of

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them are at rest rather than that they are moving, since there is nothing for things to change into, since everything belongs to everything.<sup>436</sup>

But where truth is concerned, [we must show] that not everything that appears is true. First, even if perception, at any rate of a special object, is not false, still imagination is not the same thing as perception.<sup>437</sup> Again, it is fair to wonder if our respondents are really puzzled as to the following: whether magnitudes and colors are such as they appear to people at a distance, or as they appear to those close at hand; or whether they are such as they appear to the healthy or such as they appear to the sick; or whether things are heavier if they appear so to weak people or if they appear so to strong ones; or whether things are true if they appear so to those asleep or to those awake. For that the people involved do not think so, at least, is evident. At any rate, no one who is in Libya and [while asleep] one night takes himself to be in Athens sets off for the Odeon [when he wakes up]. Further, where the future is concerned, as Plato too says, the belief of a doctor and that of an ignorant person are surely not equally in control [of the truth]—for example, about whether someone is going to become healthy or not going to.<sup>438</sup>

Further, among perceptual capacities themselves there is not the same degree of control in the case of the object of a capacity other than itself as in that of its special object, nor in the case of a neighboring object as in that of its own, but where color is concerned it is sight that has control, not taste, and where flavor, it is taste that has it, not sight.<sup>439</sup> And each of these never says in the same time frame about the same thing that it is so-and-so and not so-and-so at the same time. Nor even when different time frames are involved was there dispute about the attribute, but about the thing with which the attribute coincided. I mean, for example, that the same wine might, if either it changed or the body of the perceiver changed, seem at one time sweet and at another time not sweet. However, *the sweet*, the sort of thing it is when it is present, has in no way changed, rather the sense always grasps the truth about it, and whatever is to be sweet is of necessity of this sort. And yet all these arguments do away with this, and just as nothing is substance, so nothing is of necessity either. For what is necessary cannot possibly be in one state *and* another, so that if anything is of necessity, it will not be both so-and-so and not so-and-so.<sup>440</sup>

And in general, if indeed only the perceptible exists, nothing would exist unless animate beings existed, since there would be no perception. Now that neither perceptibles nor perceptions would exist is presumably true (since this is a way of the perceiver's being affected), but that the underlying subjects that produce perception would not exist even without perception is impossible.<sup>441</sup> For perception is certainly

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35 not perception of itself, but there is also some other thing beyond the perception, which is necessarily prior to the perception.<sup>442</sup> For what moves something is prior in nature to what is moved, and even if they  
 1011<sup>a</sup> are said to be with reference to each other, this is no less so.<sup>443</sup>

## Γ 6

There are some people who are puzzled, however, both among those who are persuaded by all this and among those who merely give these arguments.<sup>444</sup> For they are inquiring about who will discern the person  
 5 of sound mind and, in general, concerning each thing, discern it correctly.<sup>445</sup> But puzzles of this sort are like being puzzled about whether we are asleep now or awake, and all such puzzles amount to the same thing. For those who pose them demand an argument for every-  
 10 thing. For they are looking for a starting-point, and to get hold of it through demonstration, since that they, at any rate, are not persuaded is evident in their actions. But just as we said, this is how they are affected.<sup>446</sup> For they are looking for an argument for things for which there is no argument, since the starting-point of demonstration is not a demonstration.<sup>447</sup>

These people, then, might be easily persuaded of this, since it is not difficult to grasp. But those who are looking to find in argument alone  
 15 the force [that will persuade them] are looking for the impossible. For they demand to state things contrary, and at once are stating contrary things.<sup>448</sup>

If, however, not everything is relative to something, but some things also are intrinsically, not everything that appears will be true. For what appears, appears to someone, so that the person who says that everything that appears is true makes all beings relative to something. That is why those who are looking to find in argument the force [that will persuade them], and who at the same time also demand to sub-  
 20 ject themselves to argument, must guard themselves and say that it is not what appears that is true but what appears to the one to whom it appears, when it appears, to the sense to which it appears, and the way it appears. If they subject themselves to argument, however, but not on these terms, they will quickly find themselves stating contrary things. For it is possible for the same thing to appear to be honey to sight but not to taste and—since we have two eyes—for things not to appear the same to the sight of each, if the two sights are dissimilar. For to those who, due to the causes we mentioned earlier, say that what appears is true, and that this is why all things are alike false and true, since the  
 25 same things do not appear the same to everyone, or even always the  
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same to the same person, but often things have contrary appearances at the same time (for touch says there are two things when the fingers are crossed, whereas sight says there is one)—to these we shall say, “but not, at any rate, to the same sense and in the same part of it and in the same way and in the same time frame,” and so *this* would be true. And presumably this is why those who state these things not because they are puzzled but for the sake of argument must say that it is not true, but true *for this person*. As has also been said before, then, they must make everything relative to something, that is, to belief and perception, so that nothing either has come to be or will be without someone first having a belief about it. But if something has come to be or will be [without anyone’s having a belief about it], it is clear that not everything can be relative to belief.

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Further, if a thing is one, it is one relative to one thing or to something definite; and if the same thing is both half and equal, still it is not to the double, at any rate, that the equal is relative.<sup>449</sup> If, then, relative to a believer the same thing is human and the object of belief, it is not the believer who will be human but the object of belief.<sup>450</sup> And if each thing is to be relative to a believer, a believer will be relative to things that are unlimited in kind (*eidōs*).<sup>451</sup>

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The fact that the most secure belief of all is that opposite affirmations are not true at the same time, what the consequence are for those who say that they are, and why it is that they say this, may now be regarded as adequately discussed. But since it is impossible for contradictories to be true of the same thing at the same time, it is evident that contraries cannot belong to the same thing at the same time either. For one of a pair of contraries is a lack no less [than a contrary], or a lack of substance, and a lack is the denial [of a predicate] to some definite kind (*genos*).<sup>452</sup> So if it is impossible at the same time to affirm and to deny truly, it is also impossible for contraries to belong at the same time, unless either both belong in a certain way or one in a certain way and the other unconditionally.

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## Γ 7

But then neither is it possible for there to be anything in the middle between contradictories, but it is necessary either to affirm or to deny one thing, whatever it may be, of one thing.<sup>453</sup> This will be clear if we first define what truth is and what falsehood is. For to say of what is that it is not, or of what is not that it is, is false, whereas to say of what is that it is, or of what is not that it is not, is true. So he who says of anything that it is, or that it is not, will say either what is true or what

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is false. But it is said that neither what is nor what is not either is not or is.<sup>454</sup>

30 Further, what is in the middle between the contradictories will be so either in the way in which gray is between black and white or in the way in which what is neither a human nor a horse is between the two. Well, if it is in the latter way, what is in the middle could not change [into either of the extremes] (for a thing changes from not good to good or from good to not good), but in fact it evidently always does do this (for there is no change except to opposites or things in the middle). On the other hand, if it is in the middle [in the former way], then in this way  
35 too there would be some sort of coming to be that is a change to white but not a change from not white. In fact, though, this is never seen.  
1012<sup>3</sup>

Further, every object of thought and every intelligible object is one that thought either affirms or denies—this is clear from the definition—whenever it says what is true or says what is false.<sup>455</sup> Whenever it combines things this way in an affirmation or denial, it says what is true, whenever this other way, it says what is false.<sup>456</sup>

5 Further, there must be a middle beyond all contradictories, if it [the denial of PEM] is not being stated for the sake of argument.<sup>457</sup> And so someone could neither state the truth nor not state the truth, and there will be something between what is and what is not; and so there will also be a sort of change between coming to be and passing away.<sup>458</sup>

Further, in those kinds (*genos*) in which the denial implies the contrary, even in those there will be a middle—for example, in numbers  
10 there will be a number that is neither odd nor not odd; but that is impossible, as is clear from the definition.<sup>459</sup>

Further, the process will go on without limit, and the beings will be not half as many again but even more, since it will be possible to deny *this* in turn as regards its affirmation and denial, and this will be a [new] thing, since its substance is something else.<sup>460</sup>

15 Further, when someone, on being asked whether something is white, says that it is not, he has denied nothing other than that it is [white], but that it is not [white] is the denial.

Some people, however, have come to this belief as they have to other contradoxical ones: when they are unable to solve eristic arguments, they give in to the argument and accept that the conclusion is true.<sup>461</sup> But while some say what they say due to this cause, others do so  
20 because of looking for an argument for everything. In response to all these people, however, the starting-point is based on a definition. But the definition is based on the necessity of they themselves signifying something, for the account of which the name [they use] is a signifier will be a definition.

It seems, though, that whereas Heraclitus' argument, which says that everything is and is not, makes everything true, that of Anaxagoras, that there is something in the middle of contradictories, makes everything false.<sup>462</sup> For when things are mixed, the mixture is neither good nor not good, so that there is nothing true to say.<sup>463</sup>

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## Γ 8

Given these distinctions it is evident that the one-sided things that some people say, and say about everything, cannot hold good—some saying that nothing is true (for there is, they say, nothing to prevent everything from being like the commensurability of the diagonal), others that everything is true.<sup>464</sup> For these statements are pretty much the same as that of Heraclitus. For anyone who states that everything is true and that everything is false also makes each of these statements separately, so that if indeed each is impossible, the combination of the two is also impossible.

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Further, there are manifest contradictories that cannot be true at the same time—and cannot, then, all be false either—although this might *seem*, from what has been said, to be more possible.

Against all such statements, however, we must assume (as was also said in the arguments given above) not that something be or not be, but that something signify something, so that we must base discussion on a definition, having taken for granted what "falsity" and "truth" signify.<sup>465</sup> And if what it is true to affirm is nothing other than what it is false to deny, it is impossible for everything to be false, since of a contradiction one part must be true.

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Further, if it is necessary that everything be either affirmed or denied, it is impossible for both to be false, since it is *one* part of the contradiction that is false. Indeed, the often expressed objection to all such statements clearly follows, namely, that they do away with themselves.<sup>466</sup> For anyone who says that everything is true also makes the contrary of his own statement true, and so his own is not true (for the contrary statement denies that it is true), whereas anyone who says that everything is false makes his own statement so as well. But if each makes an exception of these cases, the former saying that the contrary of his statement is alone not true, the latter that his own is alone not false, it follows nonetheless that each must assume an unlimited number of statements to be true or false. For the one that says that the true statement is true is true, and this will go on without limit.

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It is evident, though, that neither those who say that all things are at rest nor those who say that all things are moving speak truly.<sup>467</sup> For if

all things are at rest, the same things will always be true and the same  
ones always false, but it is evident that this changes (for the speaker  
himself at one time was not and will not be again).<sup>468</sup> And if all things  
are moving, nothing will be true. Hence everything will be false. But  
it has been shown that this is impossible. Further, it is necessary that  
what is changes, since change is from something to something. But  
then it is not the case that all things are at rest or moving *sometimes*,  
and nothing *always*. For there is something that always moves the  
things that are moving, and the prime mover is itself immovable.

# BOOK DELTA (V)<sup>469</sup>

## Δ 1

Something is said to be a STARTING-POINT if it is: [1] The point in a thing from which we would move first—for example, of a line or of a road there is this starting-point from here, and another from the contrary direction. [2] The one from which each thing would best come to be—for example, even in learning we must sometimes begin not from what is primary, that is, the starting-point of the thing, but from the point from which it is easiest to learn.<sup>470</sup> [3] The component from which a thing first comes to be—for example, as of a ship the keel does and of a house the foundation, whereas of animals some take it that the heart does, some the brain, and others some other such thing.<sup>471</sup> [4] The *non*-component from which a thing first comes to be, from which movement and change naturally first begin—for example, a child comes to be from its father and mother, and a fight from abusive language. [5] The one in accord with whose deliberate choice what is moved is moved and what is changed is changed—for example, the rulers in cities, dynasties, and kingships are said to be *archai*, as are crafts, especially architectonic ones.<sup>472</sup> [6] Further, the one from which a thing can first be known is also said to be a starting-point of the thing—for example, the hypotheses are the starting-points of demonstrations.<sup>473</sup>

Things are also said to be causes in an equal number of ways, since all causes are starting-points.<sup>474</sup>

It is common, then, to all starting-points to be the first thing from which a thing is, or comes to be, or is known; but of these some are components, others external. That is why the nature of a thing is a starting-point, as is the element of a thing, and also thought and deliberate choice, and substance and the *for-the-sake-of-which*.<sup>475</sup> For of many things the starting-point both of knowledge and of movement is the good and the noble.<sup>476</sup>

## Δ 2<sup>477</sup>

Something is said to be a CAUSE if it is: [1] The component from which a thing comes to be—for example, the bronze of a statue or the silver of a bowl, and also the kinds (*genos*) of these.<sup>478</sup> [2] The form

or paradigm, that is, the account of the essence, and kinds (*genos*) of this (for example, of the octave, the ratio 2 : 1 and number in general), and the parts included in the account. [3] Further, that from which the change or rest from change first starts—for example, the person who has deliberated is cause [of the action] and the father of his child and in general the producer is cause of the thing being produced and the change-maker of the change. [4] Further, the end, and this is the for-the-sake-of-which—for example, of taking walks health is the end. For why does he take walks? "In order that he may be healthy," we say. And in speaking that way we think we have presented the cause. Also, anything, then, that comes to be as an intermediate means to the end, when something else has started the movement—for example, in the case of health, making thin, purging, drugs, or instruments, since all these are for the sake of the end, although they differ from each other in that some are instruments and others works.<sup>479</sup>

These, then, are pretty much all the ways in which things are said to be causes, and because they are said to be such in many ways it follows both [a] that there are many causes of the same thing, and not coincidentally (as, for example, a statue has both the craft of sculpture and the bronze as causes—not, in accord with its being another thing but insofar as it is a statue—although not in the same way, but the one as matter and the other as that from which the movement derives), and [b] that things can be causes of each other (as, for example, exercise [is a cause] of good physical condition and the latter of exercise, although not in the same way, but the one as end and the other as the starting-point of movement).<sup>480</sup> Further, the same thing can be the cause of contraries, since the thing that, when present, is the cause of so-and-so, we sometimes hold causally responsible, when absent, for the contrary result—for example, the cause of a shipwreck is the absence of the captain whose presence was a cause of its preservation. Both things, presence and lack, are causes in the way moving causes are.

All the causes now mentioned fall into four most evident ways [of being causes].<sup>481</sup> For phonetic elements are causes of syllables, matter of artifacts, fire, earth, and all such things of bodies, the parts of the whole, and the hypotheses of the conclusion, as being causes from which [the relevant things come].<sup>482</sup> And of these some are causes as underlying subject (for example, the parts), some as the essence (for example, the whole, the mode of constitution, and the form).<sup>483</sup> And the seed, the doctor, the deliberator, and in general the producer are all starting-points from which comes change or rest. The remainder are



causes as the end and the good of other things. For what other things are for the sake of tends to be the best for them and their end. Let us assume that it makes no difference whether we say "good" or "apparent good."<sup>484</sup> 25

These, then, are the causes and this is the number of their kinds (*eidōs*), but the ways of being causes, though many in number, also come under comparatively few headings. For things are said to be causes in many ways, even within the same kind (*eidōs*), as being prior or posterior to each other—for example, [as a cause] of health, the doctor and the craftsman; of the octave, the double and number; and in every case whatever includes any of the particular causes. 30

Further, there are coincidental causes and their kinds (*genos*)—for example, [as a cause of] a statue, in one way Polyclitus, in another a sculptor, because the sculptor coincides with Polyclitus, and, as examples of what includes the coincidental cause, a human is a cause of the statue, or in general an animal, because Polyclitus is human and a human is an animal.<sup>485</sup> And among coincidental causes some are more remote than others, some less—for example, if the pale and the musical were said to be causes of the statue, but not Polyclitus or a human only.<sup>486</sup> 35 1014<sup>1</sup> 5

Beyond all the things said to be causes either properly or coincidentally, however, some are said to be so potentially others actively—for example, [as a cause of] the house's being built, a builder on the one hand and a builder building on the other.<sup>487</sup>

Similarly, the things that causes are causes of will also be said to be in the ways mentioned—for example, this statue, a statue, or in general a likeness, or this bronze, bronze, or in general matter; and similarly in the case of coincidental [effects].<sup>488</sup> 10

Further, both the former [proper] and the latter [coincidental] may be said to be causes in combination—for example, not Polyclitus or sculptor but Polyclitus the sculptor.

But still all of these things are just six [i–vi] in number, each said to be in two ways [a–b]: either [a–i] as the particular, [a–ii] as the kind (*genos*), [a–iii] as the coincidental, or [a–iv] as the kind of the coincidental is, or as these are either [a–v] as combined or [a–vi] as taken simply, and [b] all of them either as actualities or potentially. But they differ to the extent that what is actual and what is particular exists, or does not exist, at the same time as the things it causes—for example, this person curing at the same time as this one recovering his health, this builder building with this building being built.<sup>489</sup> But this is not always the case with what are potentially causes, since the house does not pass away at the same time as the builder. 15 20 25

## Δ 3

Something is said to be an ELEMENT if: [1] It is the primary component from which a thing is composed, and indivisible in kind (*eidōs*) into other kinds (*eidōs*)—for example, the elements of a voiced sound are the things from which the voiced sound is composed and the ultimate things into which it is divided, while *they* are no longer divided into voiced sounds distinct in form from them, rather, if they are divided, their parts are of the same form—for example, a part of water is water (but a part of a syllable is not a syllable).<sup>490</sup> Similarly those who speak of the elements of bodies mean the ultimate things into which bodies are divided, while they are no longer divided into other things differing in form; and whether the things of this sort are one or more than one, they call these elements.

[2] In a quite similar way, things are also said to be the elements of diagrams and, in general, of demonstrations.<sup>491</sup> For the demonstrations that are primary and that are components of more than one other demonstration are said to be elements of demonstrations; and of this sort are the primary deductions consisting of three terms proceeding through one middle.<sup>492</sup>

[3] By metaphorical transference from this case people also call something an element when, being one and small, it is useful for many things. That is why what is small, simple, and indivisible is said to be an element. From which it comes about that most universal things are elements (because each of them, being one and simple, belongs to many things, either to all or to most) and that the one and the point are thought by some to be starting-points. Since, then, the so-called genera are universal and indivisible (for there is no account of them), some say that the genera are elements, and more so than the differentia because the genus is more universal—for where the differentia belongs, the genus too follows along with it, but where the genus belongs, the differentia does not always do so.<sup>493</sup>

Common to all the cases, however, is that the primary component of each thing is an element of it.

Δ 4<sup>494</sup>

What is said to be NATURE (*phusis*) is: [1] In one way, the coming to be of things that grow, as if we were to pronounce the *u* long.<sup>495</sup> [2] In another way, the first component from which a growing thing grows. [3] Further, that from which the first movement in each of the beings that are by nature is present in it insofar as it is itself.<sup>496</sup> Those things

are said to grow that get their increase in size through another thing by making contact and growing together or by adhesion, as in the case of embryos. But growing together differs from contact, since in the case of contact it is not necessary that any other thing exist besides the contact, whereas in the case of things that grow together there is some one thing, the same in both, which makes them grow together instead of [merely] making contact, and makes them one as regards continuity and quantity, although not as regards quality.<sup>497</sup>

[4] Further, that from which some one of the beings that are by nature first is or comes to be, and which is unshaped and cannot be changed from the capacity that belongs to it, is said to be its nature—for example, bronze is said to be the nature of a statue and of bronze artifacts, wood of wooden ones, and similarly in the case of others. For something is from these when the primary matter is preserved throughout.<sup>498</sup> For it is in this way that the elements of the beings that are by nature are also said to be their nature, some saying fire, some earth, some air, some water, and others some or all of these.

[5] Further, in another way the substance of the beings that are by nature is said to be their nature—as, for example, with those who say that the nature is the primary mode of constitution, or as Empedocles says:

Nothing that is has a nature,  
But rather there is only mixing and separating of things  
Mixed, and “nature” is but a name bestowed on them by men.<sup>499</sup>

That is why, as regards the things that are or come to be by nature, although that from which they naturally come to be or are is already present, we still do not say that they have their nature if they do not have their form or shape. What is by nature, then, is what is composed of both of these—for example, animals and their parts.<sup>500</sup> And nature is both the primary matter—and this in two ways, either primary relative to the thing itself or primary in general (for example, in works of bronze the bronze is primary relative to themselves, but in general perhaps water is primary, if all meltable things are water) and the form and the substance, which is the end of their coming to be.

[6] By metaphorical transference from this case every substance in general is said to be a nature, because the nature of a thing is a sort of substance.

On the basis of what has been said, then, the thing that is said to be nature in the primary and full way is the substance of things that

15 have a starting-point of movement within themselves, insofar as they are themselves. For the matter is said to be nature because it is receptive of this, and comings to be and growing because they are movements arising from it. The starting-point of change for the beings that are by nature, which is in some way a component of them, either potentially or actually, is also this.

## Δ 5

20 Something is said to be NECESSARY: [1a] If it is that without which, as a contributing cause, living is impossible—for example, breathing and nourishment are necessary for an animal, since it cannot exist without these. [1b] Also, if it is anything without which it is not possible for the good to be or come to be, or for the bad to be got rid of or taken away—for example, drinking the medicine is necessary in order not to be sick,  
25 as is sailing to Aegina in order to get the money. [2] Further, if it is forced or is force (that is, what is contrary to the impulse or the deliberate choice impedes or tends to hinder). For what is forced is said to be necessary, which is why it is also painful (as Evenus says, “every necessary thing, indeed, has a troublesome nature”) and force is a kind of necessity (as Sophocles says, “but force necessitates that I do this”).<sup>501</sup>  
30 And it seems that necessity is something that cannot be persuaded, and correctly so, since it is contrary to the movement that is in accord with deliberate choice and in accord with rational calculation.<sup>502</sup>

[3] Further, we say that it is necessary for what does not admit of being otherwise to be the way it is. And it is in accord with this sort of necessity that all the others are in some way said to be necessary.  
35 For what is forced is said to be necessary either to do or to suffer, when it is not possible to follow impulse because of what is doing the forcing—implying that necessity is that because of which it is not possible for a thing to be otherwise. And similarly in the case of the contributing causes of living and the good, since when in the one case the good, and in the other case living and being, are not possible  
without certain things, those things are necessary and that cause is a sort of necessity. Further, demonstration is among the things that are necessary, because it is not possible for something to be otherwise if it has been demonstrated unconditionally. The cause of this is the primary things, if the things from which deduction proceeds cannot be otherwise.<sup>503</sup>

10 Of some things, then, another thing is the cause of their being necessary, of others nothing is such a cause, rather, because of them other things are necessary. And so the necessary in the primary and full way

is the simple.<sup>504</sup> For it is not possible that this should be in more than one state, or even to be both in one state *and* another, since it would thereby be in more than one state.<sup>505</sup> Hence if there are certain things that are eternal and immovable, there is nothing forced or contrary to nature in them.<sup>506</sup>

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Δ 6

Things are said to be ONE either coincidentally or intrinsically: [1] Coincidentally—for example, Coriscus, the musical, and musical Coriscus are one (for it is the same thing to say “Coriscus,” “the musical,” and “musical Coriscus”), and the musical, the just, and musical and just Coriscus are one.<sup>507</sup> For all these are said to be one coincidentally, the just and the musical, because they coincide with one substance, the musical and Coriscus, because one coincides with the other. Similarly, the musical Coriscus is in a way one with Coriscus, because one of the parts in the account coincides with the other—for example, the musical with Coriscus.<sup>508</sup> And musical Coriscus is in a way one with just Coriscus, because a part of each coincides with one and the same thing. The case is similar if the coincident is said of the genus or of the names of something universal—for example, that a human and a musical human are [one and] the same. For it is either because the musical coincides with the human, who is one substance, or because each of the two coincide with some particular thing—for example, Coriscus. Except they do not both belong to him in the same way, but human presumably does so as genus and included in the substance, whereas musical does so as a state or attribute of the substance.<sup>509</sup> Things that are said to be one coincidentally, then, are said to be so in this way.

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[2a] Of things said to be one intrinsically, some are said to be so because they are continuous—for example, a bundle [is one] because of being tied together, and pieces of wood, because of being glued together.<sup>510</sup> And a line, even if bent, is said to be one if it is continuous, as is each part—for example, a leg or an arm. Of these themselves, the continuous by nature are more one than the continuous by craft. A thing is said to be continuous when its movement is intrinsically one and cannot be otherwise, and a movement is one when it is indivisible, and indivisible with respect to time. And things are intrinsically continuous when they are one but not by contact. For if you place pieces of wood so that they make contact with each other, you will not say that these are one piece of wood, or one body, or one whatever else that is continuous. Continuous things in general, then, are said to be

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one, even if they admit of being bent, but still more so those that do not admit of being bent—for example, the shin or the thigh more than the leg, because it is possible for the movement of the leg not to be one [movement]. Also a straight line is more one than a bent line. But the one that is bent and has an angle we say is both one and not one, because it is possible for its movement to be either not all at once or all at once, whereas that of a straight line is always all at once, and no part of it having magnitude is at rest while another such part moves, as with a bent line.<sup>511</sup>

[2b-i] Further, a thing is said to be one in another way when its underlying subject is undifferentiated in form, and it is undifferentiated when its form is perceptually indivisible.<sup>512</sup> The relevant underlying subject, however, is either the first or the last relative to the end.<sup>513</sup> For wine is said to be one and water is said to be one, insofar as they are indivisible in form, juices on the other hand (for example, oils and wine) and melleable things are all said to be one because the ultimate underlying subject of all of them is the same—for all of these are water or air.

[2b-ii] Things are also said to be one whose genus is one, although distinguished by opposite differentiae. And all these are said to be one because the genus that is the underlying subject of their differentiae is one (for example, horse, human, and dog are one something, because all are animals), and indeed in a way quite similar to cases in which the matter is one [as in 2b-i]. For these are sometimes said to be one in this way, and sometimes it is the higher genus that is said to be the same, if they are the ultimate species of their genus, the ones higher than these.<sup>514</sup> For example, the isosceles and the equilateral are one and the same *figure* because both are triangles, although they are not the same sorts of triangles.

[2c] Further, things are said to be one when the account that states the essence is indivisible from another that makes the thing clear—for *intrinsically* every account is divisible.<sup>515</sup> For in this way too what has increased in size and is diminishing in size is one, because its account is one, as is that of their form in the case of plane figures.<sup>516</sup> For in general when the understanding that understands the essence of certain things is indivisible, and cannot separate them in time or place or account, these things are most of all one, and of these, those that are substances are most of all one.<sup>517</sup> For those things that do not admit of division, insofar as they do not admit of it, are universally said to be one—for example, if insofar as something is a human it does not admit of division, it is one human, if insofar as it is an animal, one animal, if insofar as it is a magnitude, one magnitude.<sup>518</sup>

Now most things are said to be one because of doing or having or being affected by, or being related to, some other thing that is one, whereas the things that are said to be one in the primary way are those of which the substance is one—and one either in continuity or in form or in account. For we count as more than one either things that are not continuous, or those whose form is not one, or those whose account is not one.

Further, while in a way we say that anything is one if it is a quantity and continuous, in another way we do not say so if it is not some sort of whole, that is, if the form it possesses is not one. For example, if we saw the parts of a shoe randomly put together, we would not say that it was one in a similar way (unless we did so because of its continuity), but only if they were put together in such a way as to be a shoe, that is, so as to already possess some form that is one. That is why of all lines the circle is to the highest degree one, because it is whole and complete.<sup>519</sup>

[3] *To be one*, however, is to be a sort of starting-point of number.<sup>520</sup> For the first measure is a starting-point, since that by which we first know it is the first measure of each kind (*genos*). The starting-point, then, of what is knowable about each kind (*genos*) is what is one. But what is one is not the same thing in all kinds. For here it is a quarter-tone, there a vowel or consonant; another thing in the case of weight, and something else in that of movement. In every case, however, what is one is indivisible either in quantity or in form. Now what is indivisible in quantity, when it is indivisible in all dimensions and lacks position, is said to be a *unit*, and when it is indivisible in all dimensions and has position, a *point*. What is divisible in quantity in one dimension is a *line*, in two a *plane*, in all—that is, in three—a *body*. And, reversing the order, what is divisible in two dimensions is a plane, in one dimension a line, and what is in no dimension divisible in quantity is a point or unit, what lacks position being a unit and what has position a point.

Further, some things are one in number, others in form, others in kind (*genos*), others by analogy: in number, those whose matter is one; in form (*eidos*), those whose account is one; in kind (*genos*), those whose figure of predication is the same; by analogy, those related as another thing is to another thing.<sup>521</sup> And the latter sorts always follow along with the earlier ones—for example, those that are one in number are also one in form, whereas those that are one in form are not all one in number; but those that are one in form are also one in kind (*genos*), whereas those that are one in kind are not all one in form, but are all one by analogy; on the other hand, those that are one by analogy are not all one in kind.

Also, it is evident that things will be said to be MANY in ways opposite to those in which they are said to be one. For some things will be many because they are not continuous, others because their matter, whether primary or ultimate, is divisible in form, others because the accounts that state their essences are more than one.<sup>522</sup>

## Δ 7

Something is said to BE on the one hand coincidentally and on the other intrinsically: [1] Coincidentally—for example, we say that the just person is musical, and the human is musical, and the musical is human, and this is quite similar to saying that the musical builds, because the builder happens to be musical or the musical happens to be a builder (for here “this is this” signifies “this coincides with this”).<sup>523</sup> And so it is in the cases we mentioned. For when we say that the human is musical and the musical is human, or that the pale is musical or the musical is pale, in the last two it is because [1a] both attributes coincide with the same thing, and in the first because [1b] the attribute coincides with the thing that is a being, whereas the musical is human because [1c] the musical coincides with a human (it is in this way too that the not-pale is said to be, because what it coincides with is a being). Things that are said to be coincidentally, then, are said to be in this way, either because [1a] both belong to the same thing that is a being, or because [1b] that to which one belongs is a being, or because [1c] the thing itself, to which belongs that thing of which it itself is predicated, is a being.<sup>524</sup>

[2] The things said to be intrinsically are the very ones signified by the figures of predication.<sup>525</sup> For the ways in which things are said [to be] are the ways in which “being” (*to einai*) signifies. So since of things predicated of a thing some signify what it is, some a quality [of it], some a quantity, some a relation, some a doing or a being affected, some a where, some a when, “being” (*to einai*) signifies the same thing as each of these. For there is no difference between “a human is keeping healthy” and “a human keeps healthy,” nor between “a human is walking” or “cutting” and “a human walks” or “cuts,” and similarly in the other cases.

[3] Further, “being” (*to einai*) or “is” (*to estin*) signify that something is true, and “not to be” (*to mê einai*) that it is not true but rather a falsehood—similarly, in the case of affirmation and denial. For example, “it is” (*esti*) that Socrates is musical signifies that this is true, “it is” (*esti*) that Socrates is not pale, that this is true; whereas, “it is not” that the diagonal is commensurable signifies that this is false.<sup>526</sup>



[4] Further, "is" (*to einai*) and "being" (*to on*) signify the things we mentioned on the one hand potentially on the other actually. For we say both of what potentially sees and of what actually sees that it is "a seeing thing," and, in the same way, both of what is capable of using its scientific knowledge and of what is using it that is "a scientifically knowing one," and both of what rest already belongs to and of what is capable of resting that it is "a resting thing." Similarly too in the case of substances. For we say of Hermes that "he is in the stone," and of the half-line that "it is in the line," and of what is not yet ripe that "it is corn." But when something is capable and when it is not yet capable must be determined elsewhere.<sup>527</sup>

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Δ 8

Said to be SUBSTANCES are: [1] The simple bodies (for example, earth, fire, water, and everything of that sort) and bodies in general and the things composed of them, both animals and divine beings, and the parts of these.<sup>528</sup> Each of these is said to be a substance because it is not said of an underlying subject but rather the other things are said of it. [2] And in another way, any component that is the cause of being in such things as are not said of an underlying subject—for example, the soul in the case of an animal.<sup>529</sup> [3] Those component parts of such things that define them and signify a this something and whose destruction destroys the whole—as, for example, the plane's does to the body, as some people say, and the line's does to the plane; and in general number seems to be a thing of this sort to some people—for they think that nothing is if number is done away with, and it defines all things.<sup>530</sup> [4] Further, the essence, the account of which is a definition, is said to be each thing's substance.<sup>531</sup>

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It follows, then, that something is said to be substance in two ways, either it is [a] the ultimate underlying subject that is no longer said of anything else or [b] that which, being a this something, is also separable—and the shape and form of each thing is like this.<sup>532</sup>

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Δ 9

[1] Some things are said to be the SAME (*tauta*) coincidentally—for example, the pale and the musical are the same because they coincide with the same thing, and human and musical are the same because one of them coincides with the other, and the musical is human because it coincides with the human.<sup>533</sup> And the musical

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human is the same as each of the other two and each of them as it, for both the human and the musical are in fact said to be the same as the musical human, and he the same as they. That is why all these are not said universally, since it is not true to say that every man is the same as the musical. For universals belong intrinsically, whereas coincidents do not belong intrinsically.<sup>534</sup> But in the case of particulars they are said of them unconditionally, since Socrates and musical Socrates seem to be the same.<sup>535</sup> But Socrates is not said of more than one thing, which is why we do not say "every Socrates" as we say "every human."

Some things, then, are said to be the same in this way. [2] Others are said to be the same intrinsically and in as many ways as things are said to be one.<sup>536</sup> For things whose matter is one, either in form or in number, are in fact said to be the same, as are things whose form is one, so that it is evident that sameness is a sort of oneness of the being either of more than one thing or of one thing when it is treated as more than one—for example, when we say that a thing is the same as itself, which is to treat it as two things.

Things are said to be DISTINCT (*hetera*) [or OTHER] when either their forms or their matter or the account of their substance are more than one.<sup>537</sup> And in general things are said to be distinct in ways opposite to those in which they are said to be the same.

[1] Those things are said to be DIFFERENT (*diaphora*) which are distinct, though they are the same something—only not in number but either in form or in kind (*genos*) or by analogy.<sup>538</sup> [2] Further, those that are distinct in kind (*genos*); and contraries; and those that have distinctness in their substance.<sup>539</sup>

Things are said to be SIMILAR whose attributes are the same in every respect, and those more of whose attributes are the same than other, and those whose quality is one.<sup>540</sup> Also, what shares with something else a majority of those contraries with respect to which alteration is possible or those with more control is similar to that thing.<sup>541</sup>

Things are DISSIMILAR in ways opposite to those in which they are similar.

## Δ 10

Things said to be OPPOSITES (*antikeimena*) include contradictories, contraries, relatives, lacking and having, and the extremes that comings to be and passings away are from and to. And all things that cannot be present at the same time in what is receptive of both are said

to be opposed—either themselves or their components (for gray and white do not belong at the same time to the same thing, because their components are opposed).<sup>542</sup>

Said to be CONTRARIES are: [1] Those things differing in genus that cannot belong to the same thing at the same time. [2] The most different of the things in the same genus. [3] The most different of the things in the same recipient. [4] The most different of the things falling under the same capacity. [5] The things whose difference is greatest either unconditionally or in genus or in species.<sup>543</sup> Other things are said to be contraries, either because of having ones of the same sorts as these, or because of being receptive of them, or being productive of them, or capable of being affected by them, or because of in fact producing or being affected by them, or because of being losses or acquisitions, or havings or lackings, of them.

But since things are said to be one and said to be in many ways, the others that are said to be in accord with these must also follow along with them, so that same, other, and contrary must be distinct in each category.<sup>544</sup>

Things said to be DISTINCT [OR OTHER] IN SPECIES are those that are of the same genus but not subordinate to each other; any things that are in the same genus that have some difference; and any things that have contrariety in their substance.<sup>545</sup> Also contraries are distinct in species, either all of them or those said to be such in the primary way. Also those things whose accounts are distinct in the ultimate species of their genus—for example, human and horse are indivisible in genus, whereas their accounts are other [in this way]; also, any things that, being in the same substance, have a difference.<sup>546</sup>

Δ 11

Among things said to be PRIOR and POSTERIOR, [1] some are so said on the supposition that there is a first and a starting-point in each genus, because they are closer to a certain starting-point defined either unconditionally and by nature, or with reference to something or somewhere or by certain people. For example, things are prior in place by being closer to some place defined either by nature (for example, the middle or the last place) or with reference to something random; and what is further away is posterior.<sup>547</sup> Others things are prior in time, some by being further from now, as in the case of things that have come to be (for the Trojan Wars are prior to the Persian because they are further from now), some by being closer to now, as in the case of things that are to come (for the Nemean Games

are prior to the Pythian because they are closer to now, treating now as starting-point and first). Others are prior in movement (for what is closer to the first mover is prior—for example, the boy is prior to the man). For the first mover too is unconditionally a sort of starting-point. Others are prior in capacity. For what is superior in capacity, that is, what is more capable, is prior. Of this sort is that whose deliberate choice it is necessary for another thing—the posterior one—to follow, so that if the former does not move it, the latter is not moved, and if the former moves it, the latter is moved, and the deliberate choice is starting-point.<sup>548</sup> Others are prior in order, when there is some one definite thing relative to which things are arranged at intervals in accord with some account—for example, in a chorus the second person is prior to the third, and in the lyre the next-to-bottom string to the bottom one, since in the one case the chorus leader and in the other the middle string is the starting-point. These things, then, are said to be prior in this way.

[2] But in another way what is prior in knowledge is treated as also unconditionally prior. Of these things, the prior in account are distinct from the prior in perception.<sup>549</sup> For universals are prior in account, whereas particulars are prior in perception. Also, in account the coincident is prior to the whole—for example, the musical is prior to the musical human. For without the part the account will not be whole. And yet it is not possible to be musical without being a musical something.

[3] Further, the attributes of what is prior are said to be prior—for example, straightness to smoothness. For the first is an intrinsic attribute of a line, and the second of a surface. Some things, then, are said to be prior and posterior in this way.

[4] Others, however, are said to be so in nature and substance, when it is possible for them to be without other things, but not the others without them—a distinction used by Plato. But since there are many ways of being, first, the underlying subject is prior, which is why the substance is prior. Second, the potential cases are distinct from the actual ones. For some things are potentially prior, others actually so—for example, potentially, the half-line is prior to the whole, and the part to the whole, and the matter to the substance, whereas actually, they are posterior, since it is [only] when the whole has been dissolved that the part will actually be.

In a way, then, all the things that are said to be prior and posterior are said to be such with reference to these.<sup>550</sup> For some things can be without others with respect to coming to be (for example, the whole without the parts), others, with respect to passing away

(for example, the part without the whole).<sup>551</sup> Similarly in the other cases too.<sup>552</sup>

Δ 12<sup>553</sup>

[1] Something is said to be a CAPACITY [POTENTIALITY, POWER] when it is a starting-point of movement or change either in another thing or in a thing insofar as it is other—for example, the craft of building is a capacity that is not a component of the thing being built, whereas the craft of making healthy, which is a capacity, might be a component of the thing being made healthy, but not of it insofar as it is being made healthy.<sup>554</sup> The starting-point of change or movement is said to be a capacity in this way, then, when the change or movement is *in* another thing or in a thing insofar as it is other. [2] But also when it is caused by another thing or by a thing insofar as it is other. For it is in virtue of the starting-point, in virtue of which the thing that is affected is affected, that we say it has the capacity to be affected, sometimes when it is affected in any way at all, sometimes not in virtue of every affection, but when it is for the better.

[3] Further, there is the capacity to accomplish the thing in question well or in accord with deliberate choice. For of those who merely walk or speak, but not well or not as they deliberately choose, we sometimes say that they are not capable of speaking or walking. [4] Similarly too in the case of being affected.

[5] Further, the states in virtue of which something is wholly unaffectedable or unchangeable or not easily moved for the worse are said to be capacities. For things get broken and crushed and bent and in general pass away not by being capable but by being not capable and deficient in something. And they are unaffectedable in these ways if they are scarcely or slightly affected because of a capacity they have and by being capable and being in some state.

Since things are said to be capacities in those many ways, so too what is said to be CAPABLE is in one way what has a starting-point of movement or change—for even what can bring things to rest is capable in a way—in another thing or in a thing insofar as it is other. And in another way if something else has a capacity of this sort with regard to it. And in another way if it has the capacity to change into something, whether for the worse or the better. For even what passes away seems to be capable of passing away, since it would not have passed away if it were incapable of it. As things stand, though, it has a certain disposition, cause, or starting-point to be affected in this way. Sometimes indeed it seems that way by having something, sometimes by lacking

something. But if a lack is in a way a having, everything would be something by having, so that things would be capable both from having a certain sort of state and starting-point and by having the lack of having it, if it is possible to have a lack—or, if this is not possible, things will be capable homonymously.<sup>555</sup> [4] And in another way, if neither another thing nor the thing itself insofar as it is other has a capacity or a starting-point that is destructive of it. Further, all of these are said to be capable of something either merely because the thing might happen to come about or not to come about, or because it might do so *well*. In fact, the latter sort of capacity is found even in inanimate things, such as instruments. For it is said that one lyre can speak, whereas another cannot do so at all, if it does not have a good tone.

INCAPACITY is lack of capacity, that is, lack of the sort of starting-point that has been described, either generally or by what naturally should have it, or even by what at the time should naturally already have it. For a boy, a man, and a eunuch would not in the same way be said to be incapable of begetting children. Further, to each of the two sorts of capacity there is an opposite incapacity—both to what can merely produce movement and to what can produce movement well.

Some things, then, are also said to be incapable in virtue of this sort of incapacity, whereas others are in another way both capable and incapable, namely, [POSSIBLE and IMPOSSIBLE], where an impossible thing is that of which the contrary is of necessity true.<sup>556</sup> For example, it is impossible for the diagonal to be commensurable, because something like that is a falsehood whose contrary is not only true but also necessary.<sup>557</sup> Hence that it is commensurable is not only false but of necessity false. The contrary of this, the possible, is found whenever it is not necessary that the contrary is false—for example, that a human be sitting down is possible, since that he is not sitting down is not of necessity false. In one way, then, the possible, as was said, signifies what is not of necessity false; in another what is true; and in another what admits of being true.

What in geometry is said to be a POWER is so by metaphorical transference.<sup>558</sup>

These things are capable [that is, are POSSIBLE or have a POWER], then, not in virtue of a capacity. Those that are said to be capable in virtue of a capacity are all said to be such with reference to the primary one, that is, the starting-point of change in another thing or in a thing insofar as it is other. For the others are said to be capable because something else has a capacity of the relevant sort with regard to them, some because it does not have it, some because it has it in a particular way. Similarly too things that are incapable. And so

the strict definition of the primary sort of capacity will be: what is a starting-point of change in another thing or in a thing insofar as it is other.<sup>559</sup>

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Δ 13

Something is said to be a QUANTITY when it is divisible into components each of which is naturally a one and a this something.<sup>560</sup> A quantity is a plurality if it is countable, a magnitude if it is measurable. Something is said to be a plurality when it is potentially divisible into non-continuous parts, a magnitude when potentially divisible into continuous ones. Of magnitudes those continuous in one dimension are lengths, in two, breadths, in three, depths. Of these, limited plurality is a number, limited length a line, limited breadth a surface, limited depth a body.

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Further, some things are said to be quantities intrinsically, others coincidentally—for example, a line is intrinsically a certain quantity, whereas the musical is coincidentally a quantity.<sup>561</sup> Of those that are intrinsically quantities, some are so in virtue of their substance—for example, a line is a certain quantity in this way, since “a certain quantity” belongs in the account that says what it is. Others are attributes and states of such substances—for example, the much and the little and long and short, broad and narrow, deep and shallow, and others of that sort. Both the great and the small and greater and smaller, either when said to be such intrinsically or in relation to each other, are intrinsic attributes of quantity. However, these names are also transferred to other things.

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Of things said to be quantities coincidentally, some are said to be such in the way in which it was said that the musical and the pale are quantities, namely, in virtue of there being a certain quantity to which they belong; others in the way in which a movement and a time are. For these too are said to be certain quantities and continuous, because of the divisibility of the things of which they are attributes. I mean not the thing being moved but the amount by which it was moved. For because of that being a quantity the change too is a quantity, and the time because of *its* being one.

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Δ 14

[1] What is said in one way to be a QUALITY is a differentia of substance.<sup>562</sup> For example, human is animal qualified in a certain way because two-footed, horse because four-footed. Also, circle is shape

qualified in a certain way because it is without angles, on the grounds  
 that a differentia that is with regard to substance is a quality. This, then,  
 is one way in which something is said to be a quality—a differentia of  
 substance. [2] But there is another way exemplified by the immovable  
 objects and the objects of mathematics, as in the case of the numbers  
 being of a certain quality—for example, composite ones, which are not  
 in one dimension only, but of which the plane and the solid are repre-  
 sentations (these being the ones that have two or three factors).<sup>563</sup> And  
 in general any constituent [of a number] beyond quantity that is in its  
 substance is a quality. For the substance of each is what it is once—for  
 example, that of six is not what it is twice or three times but what it is  
 once, since six is one times six.<sup>564</sup>

[3] Further, qualities include all the affections of moving substances,  
 in virtue of which, when they change, bodies are said to alter—for  
 example, hotness and coldness, paleness and darkness, heaviness and  
 lightness, and the others of that sort.

[4] Further, something is said to be a quality with reference to virtue  
 and vice and, in general, to bad and good.

Something is said to be a quality, then, in pretty much two ways,  
 one of which is the most strict. For quality in the primary sense is the  
 differentia of the substance. And of this the quality in numbers is a  
 part. For it is a sort of differentia of substances, but either not of mov-  
 ing things or not of them insofar as they are moving.<sup>565</sup> Second, there  
 are the affections of things that move, insofar as they move, and the  
 differentiae of the movements. Virtue and vice are a part of these affec-  
 tions.<sup>566</sup> For they make clear the differentia of the movement or the  
 activity, in accord with which the things in movement act or are acted  
 on either nobly or basely.<sup>567</sup> For what can be moved or can be active  
 in one way is good, and what can be so in another way—the contrary  
 way—is depraved. Good and bad signify quality most of all in the case  
 of animate things, and among these above all in the case of those that  
 have deliberate choice.<sup>568</sup>

## Δ 15

Things are said to be RELATIVE: [1] As double relative to half and  
 triple relative to one third, and, in general, multiple relative to sub-  
 multiple, and what exceeds relative to what is exceeded. [2] As what  
 is capable of heating relative to what is capable of being heated, what  
 is capable of cutting relative to what is capable of being cut, and,  
 in general, what is capable of acting relative to what is capable of  
 being acted on. [3] As the measurable relative to the measure, the



scientifically knowable to scientific knowledge, and the perceptible to perception.<sup>569</sup>

[1] The first lot are said to be relative numerically, whether unconditionally or in a definite way, and relative to themselves or to one. For example, the double is a definite number relative to one, whereas the multiple is in a numerical, but not a definite, relation to one—for example, not in this or that relation to it. The relation of the one-and-a-half to its reciprocal is a definite numerical relation to a number, whereas the one-and-a-bit is related to its reciprocal by an indefinite relation, just as the multiple in relation to one. But the relation of the excedder to the exceeded is wholly indefinite numerically. For number is always commensurable and what is non-commensurable is not said to be a number, whereas the excedder is, relative to the exceeded, so-and-so much plus something more, and this is indefinite, since it can, at random, be either equal or not equal to the exceeded.

All these things, then, are said to be relative with reference to number and are attributes of number. As, in a further way, are the equal, the similar, and the same. For they are all said of things with reference to one. For things are the same when their substance is one; similar, when their quality is one; and equal, when their quantity is one. And one is the starting-point and measure of number, so that all these are said of things with reference to number, although not in the same way.

[2] Things that can act or be acted on are said to be relative with reference to a capacity to act or be acted on and to the activations of the capacities. For example, what is capable of heating is relative to what is capable of being heated, because it *can* heat it, and in turn what is heating is relative to what is being heated, and what is cutting to what is being cut, as actively doing the things. Of numerical relations, on the other hand, there are no activations, except in the way that has been stated elsewhere, but activations [that are said to be such] with reference to movement do not belong to them.<sup>570</sup>

Of things that are said to be relative with reference to a capacity, some are already said to be so with reference to time—for example, what has made is relative to what has been made, and what will make to what will be made. For it is in this way that a father is said to be the father of his son, since the one has acted and the other has been acted on in a certain way.<sup>571</sup> Further some things are said to be relative with reference to the lack of a capacity, such as the incapable and anything else said to be [what it is] in that way—for example, the invisible.

Things that are said to be relative with reference to a number or a capacity, then, are all relative because of being said to be just what they are of *another thing*, not because of the other thing's being relative to them.<sup>572</sup>

[3] But what is measurable or scientifically knowable or thinkable is said to be relative because of another thing's being said to be [what it is] relative to them. For what is thinkable signifies that there can be a thought of it, but the thought is not relative to what it is a thought of, since we would then have said the same thing twice.<sup>573</sup> Similarly sight is the sight of something, not of what it is the sight of (though of course it is true to say this). Instead, it is relative to color or something of that sort. But the other way the same thing will be said twice: sight is of what sight is of.

Things that are said to be intrinsically relatives are said to be such sometimes in these ways, sometimes if their genera are of the relevant sort—for example, medicine is included among the relatives because its genus, scientific knowledge, seems to be a relative.<sup>574</sup> Further, those things are said to be relatives with reference to which their possessors are said to be relatives—for example, equality is a relative because the equal is, and similarity because the similar is. Other things are said to be relatives coincidentally—for example, human is a relative because double coincides with it, and double is a relative, or the pale is, if double and pale coincide in the same thing.

## Δ 16

What is said to be COMPLETE is: [1] one, that outside which not even one part is to be found—for example, the complete time of each thing is the one outside which there is no time to be found that is part of that time. [2] That which, as regards virtue or the good, cannot be surpassed relative to its kind (*genos*)—for example, a doctor is complete and a flute-player is complete when they lack nothing as regards the form of their own proper virtue.<sup>575</sup> (It is in this way, transferring the term to bad things, we speak of a complete scandalmonger and a complete thief—indeed we even say that they are good, for example, a good thief and a good scandalmonger.) Also, virtue is a sort of completion. For each thing is complete and every substance is complete when, as regards the form of its proper virtue, it lacks no part of its natural magnitude.

[3] Further, things that have attained their end, this being something excellent, are said to be complete. For things are complete in virtue of having attained their end. So, since the end is a last thing,

we transfer the term to base things and say that a thing has been completely ruined and completely destroyed, when there is no deficiency in its destruction and badness but it has reached its last. This is why death, too, is by metaphorical transference said to be an end, because both are last things. And the end—that is, the for-the-sake-of-which—is a last thing.

This, then, is the number of ways in which things said to intrinsically complete are said to be such, some because with respect to goodness they are deficient in nothing and can neither be exceeded nor can anything of theirs be found outside them, others because in general they cannot be exceeded in their several kinds (*genos*) and have nothing of theirs outside them. The rest are said to be complete with reference to these, because they either produce or possess something of the relevant sort, or are fitted for it, or in some way or other are said to be complete with reference to the things that are said to be such in the primary way.

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1022<sup>a</sup>

Δ 17

What is said to be a LIMIT is: [1] The last point of each thing, that is, the first outside which it is not possible to find any part, or the first inside which every part is found. [2] The form, whatever it may be, of a spatial magnitude or of what has spatial magnitude.<sup>576</sup> [3] The end of each thing (that *toward which* there is movement or action, not that *from which*—although sometimes it is both, that from which and that toward which) and the for-the-sake-of which.<sup>577</sup> [4] The substance of each thing and the essence of each (for this is the limit of knowledge; and if of knowledge, of its object too).<sup>578</sup> So it is evident that things are said to be a limit in as many ways as they are said to be a starting-point, and yet more. For a starting-point is a sort of limit, but not every limit is a starting-point.

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Δ 18

Something is said to be that IN VIRTUE OF WHICH (*kath' ho*) in many ways: [1] The form and the substance of each thing—for example, that in virtue of which a man is good is good itself.<sup>579</sup> [2] The primary thing in which something naturally comes to be—for example, color in a surface.<sup>580</sup> The primary way, then, in which something is said to be that in virtue of which is by being the form, and in a secondary way by being the matter of each thing and the first underlying subject of each.<sup>581</sup>

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In general, that in virtue of which belongs to things in the same number of ways as the cause does. [3-4] For we say indifferently "in virtue of what has he come?" and "for the sake of what has he come?" and "or in virtue of what has he deduced, or wrongly deduced?" and "what is the cause of his deducing, or wrongly deducing?"

[5] Further, something is said to be *kath' ho* with reference to position—for example, *at which* he stands based, or along which he walks, since all these signify position or place.<sup>582</sup>

SO INTRINSICALLY [OR IN VIRTUE OF ITSELF] must also be said of things in many ways. [1] For in one way, the essence of each thing is what it is intrinsically—for example, Callias is intrinsically Callias, and the essence of Callias.<sup>583</sup> [2] In another way, anything that is present in the what-it-is—for example, Callias is intrinsically an animal.<sup>584</sup> For animal is present in his account, since Callias is a sort of animal.

[3] Further, if it, or one of its parts, is the primary recipient—for example, a surface is intrinsically white, and a human is intrinsically alive, since the soul, which is a part of a human, is the primary recipient of life.

[4] Further, what has no other cause. For a human has many causes, the animal, the two-footed, nonetheless a human is intrinsically a human.<sup>585</sup>

[5] Further those attributes are intrinsic to a subject that belong to it alone, and insofar as they belong to it merely because of itself, considered as what is separate by itself.<sup>586</sup>

## Δ 19

What is said to be a DISPOSITION is the arrangement of what has parts with respect either to place or capacity or form. For it must be some sort of position, as the name "*disposition*" also makes clear.

## Δ 20

[1] What is said to be a HAVING [OR STATE] in one way is a sort of activation of the haver and what he has, like a sort of action or movement.<sup>587</sup> For when one thing makes and another is made, there is a making between them. In the same way, too, between the one who has clothes and the clothes he has there is a having. This sort of having, then, we evidently cannot *have*. For it would go on without limit if it were possible to have the having of what we have. [2] What is said to be a having [or state] in another way is a disposition in virtue of which

what is disposed is either well or ill disposed, and either intrinsically or with reference to something else—for example, health is a state, since it is a disposition of this sort. [3] Further, anything that is a part of such a disposition is said to be a state—which is why the virtue of [a thing's] parts is also a state.

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Δ 21

What is said to be an AFFECTION (*pathê*) [1] in one way is a quality in virtue of which a thing can be altered—for example, white and black, sweet and bitter, heaviness and lightness, and other things of that sort, [2] in another way, the activations of these—the already accomplished alterations. [3] Further, of these, especially alterations and movements that are injurious—above all, painful injuries. [4] Further, large-scale misfortunes and painful experiences are said to be affections.<sup>588</sup>

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Δ 22

[1] Something is said to LACK something in one way if it does not have one of the attributes that something-or-other naturally has, even if this thing itself does not naturally have it—for example, a plant is said to lack eyes. [2] In another way if what it or its genus naturally has, it itself does not have—for example, a human who is blind and a mole lack sight in different ways, the one in contrast to its genus, the other intrinsically. [3] Further, if it does not have what it is natural for it to have when it is natural for it to have it. For blindness is a sort of lack, but a being is not blind at any and every age, but only if it does not have sight when it is natural for it to have it. Similarly, if it does not have sight in that in which, and in virtue of which, and in relation to which, and in the way in which, is natural.<sup>589</sup> [4] Further, a thing forcefully taken away is said to be lacked.

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Also, things are said to be lacks in as many ways as there are ways of saying things with a negative affix. For something is said to be *un*-equal because it does not have the equality it is natural for it to have, and *in*-visible either because it has no color at all or because it has minimal color, and foot-*less* either because it has no feet or minimal feet. Further, a thing is said to lack something if it has little of it—for example, pitless fruit. This is a case of having it minimally. Further, if it does not have it easily or well—for example, we say that something is uncuttable not only if it cannot be cut but if it cannot be cut easily or well. Further, if it does not have it at all. For a man who has no sight in

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1023<sup>a</sup>1

5 one eye is not said to be blind but the one who has no sight in either eye. This is why not everyone is good or bad, just or unjust, but there is also an intermediate state.

## Δ 23

10 Something is said TO HAVE [OR HOLD] in many ways. [1] One way is to treat it in accord with the possessor's own nature or in accord with its own impulse. That is why a fever is said to have hold of a human being and tyrants to have hold of their cities, and people to have the clothes they wear. [2] In another way, what a thing is present in, as in something receptive of it, is said to have it—for example, the bronze has the form of the statue, and the body has the disease. [3] In another way, what encompasses something is said to hold what it encompasses. For 15 what is in what encompasses it is said to be held by it—for example, that the vessel holds liquid, and the city human beings, and the ship sailors. And it is this way that the whole has its parts. [4] Further, what hinders a thing from moving or acting in accord with its own impulse is said to hold it—for example, the pillars hold the weight lying on them, and, as the poets say, "Atlas holds up the heaven," on the supposition that it would fall to the earth otherwise, as some of the physicists 20 also say.<sup>590</sup> This is also the way in which what holds things together is said to hold them together, on the supposition that they would otherwise separate, each in accord with its own impulse. Also things are said to be IN something in ways that are similar to and correspond to those 25 in which they are said to have them.

## Δ 24

[1] Something is said to be OF [OR FROM] something in one way if it is of it as of matter, and this in two ways, either with respect to the first genus or with respect to the ultimate species—for example, in one way everything meltable is of water, but in another way a statue is of bronze.<sup>591</sup> [2] In another way, if it is of it as of a first starting-point of having moved—for example, what did the fight come of? It came of 30 abusive language, because this was the starting-point of the fight. [3] In another way, if as of the composite of matter and shape—as the parts are of the whole, and the verse of the *Iliad*, and the stones of the house. For the shape is an end, and what possesses its end is complete. [4] In other cases, as the form of its parts—for example, the human from the two-footed and the syllable from the letter. For this is different from 35 the way in which the statue is of bronze. For a composite substance is

[composed] of perceptible matter, but the form is also [composed] of the matter of the form.<sup>592</sup>

1023<sup>b</sup>1

Some things, then, are said to be of [or from] something in these ways. [5] Others, if it belongs to them in one of these ways to be of a part of it—for example, the child is of its father and mother, and plants are of the earth, because they are of a part of these things.<sup>593</sup> [6] In another way, something is said to come of something if it comes after it in time—for example, night comes of day and a storm comes of good weather, because one comes after the other. Of these things, some are said to do so because they admit of change into each other, as in the cases mentioned just now, others merely because they are successive in time—for example, the voyage took place “of” the equinox, because it took place after the equinox, and the festival of the Thargelia comes “of” the Dionysia, because after the Dionysia.<sup>594</sup>

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# Δ 25

[1] What is said to be a PART in one way is what a quantity can in any way be divided into. For what is subtracted from a quantity insofar as it is a quantity is always said to be a part of it—for example, two is said to be a part of three. [2] In another way, only the ones among the first lot that are measures—which is why two is said to be part of three in one way, whereas in another way it is not.<sup>595</sup> [3] Further, what the species, quantity aside, can be divided into are also said to be parts of it—which is why we say that the species of a genus are its parts.<sup>596</sup> [4] Further, the things into which a whole, whether a form or something that has a form, is divided, or of which it is composed—for example, of the bronze sphere or the bronze cube both the bronze (that is, the matter in which the form is) and the angle are parts.<sup>597</sup> [5] Further, the things in its account that make a given thing clear are also parts of the whole—which is why the genus is said to be a part of the species, although in another way the species is a part of the genus.<sup>598</sup>

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# Δ 26

Something is said to be a WHOLE if: [1] None of the parts of which it is said to be by nature a whole is absent from it. [2] It is what encompasses the things it encompasses in such a way that they are one, and this in two ways—either [2a] as each being one or [2b] as together composing one. For [2a] what is universal, or in general what is taken as such when we say “as a whole,” is universal as encompassing many things by being predicated of each of them, and by all of them—each

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one of them—being one thing, as human, horse, and god are, because all are living things. But [2b] what is continuous and limited is a whole when it is one thing composed of many things, especially if they are present in it potentially, but, failing this, if they are actively present in it.<sup>599</sup> Of these themselves, those which are by nature of such a sort are  
 35 wholes to a higher degree than those that are so by craft, as we also said in the case of what is one, wholeness being in fact a sort of oneness.<sup>600</sup>

[3] Further, of quantities that have a starting-point, a middle, and an  
 1024<sup>a</sup> end, those to which the position of the parts makes no difference are said to be alls, and those to which it does, wholes. Those that admit of both are both wholes and alls. These are things whose nature remains the same when the parts change position while their shape does not remain the same—for example, wax or a cloak. For they are said to  
 5 be both wholes and alls, since they have both characteristics. Water and all liquids and number, on the other hand, are said to be alls, but things are not said to be the whole number or the whole water except by metaphorical transference.

Things to which “all” is applied as to one thing are said to be EVERY, “every” being applied to them as divided up—“all this number,” but  
 10 “every one of these units.”

## Δ 27

Not just any random quantity is said to be DOCKED, on the contrary, it must be divisible into parts and also a whole.<sup>601</sup> For not only is two not docked if one of its pair of ones is subtracted (for what is subtracted by docking and what remains are never equal), but in general no number is docked in this way. For it is also necessary that the substance remain.  
 15 For if a cup is “docked,” it must still be a cup, whereas the number is no longer the same. Further, not even all things that have dissimilar parts are said to be docked, since in one way a number has dissimilar parts too (for example, two and three). But in general none of the things to which the position of their parts makes no difference—for example, water and fire—are said to be docked. On the contrary, for a thing to be such it must in virtue of its substance have parts with position. Further, it must be continuous. For a musical scale is composed  
 20 of non-homoeomerous parts, and parts that have a position, but cannot become docked.<sup>602</sup> In addition to this, not even the things that are wholes are docked by the lack of any part whatsoever. For the parts must be neither those that control the substance nor those positioned just anywhere.<sup>603</sup> For example, a cup is not “docked” if a hole is bored in  
 25 it, but only if the handle or a projecting part is removed, and a human



being, not if some flesh or the spleen is removed, but if an extremity is—and this not any extremity but one that when wholly removed cannot grow back. This is why bald people are not “docked.”<sup>604</sup>

Δ 28

Something is said to be a GENUS [or RACE] if: [1] The coming to be of things with the same form is continuous—for example, “as long as the race of humans lasts” means “as long as the coming to be of humans is continuous.” [2] It is the first mover that brought things into existence. For it is in this way that some are said to be Hellenes by race and others Ionians, because the former come from Hellen and the latter from Ion as their first begetter.<sup>605</sup> And more so when from the male begetter than when from the matter, although the race is also sometimes named from the female—for example, the descendants of Pyrrha.<sup>606</sup> [3] Further, as the plane is said to be the genus of plane figures and solid of solids. For each of the figures is in the one case a plane of such-and-such a sort and in the other a solid of such-and-such a sort, this being the underlying subject for the differentiae. [4] Further, as the first constituent in accounts is said to be—the one said in the what-it-is.<sup>607</sup> For this is the genus, whose differentiae the qualities are said to be.<sup>608</sup>

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1024<sup>b</sup>1

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Something is said to be a genus, then, in all these ways: [1] with reference to continuous coming to be of the same form; [2] with reference to the first mover that is the same in form [as the things it begets]; [3–4] as matter, since that to which the differentia or quality belongs is the underlying subject, which we call the matter.

[1] Things are said to be DISTINCT [or OTHER] IN GENUS whose primary underlying subjects are distinct, and when the one is not analyzed into the other or both into the same thing—for example, the form and the matter are distinct in genus. [2] As also are those that are said of something with reference to distinct figures of predication of being.<sup>609</sup> For some beings signify what it is, others a quality, others the various other things that were distinguished earlier.<sup>610</sup> These too are neither analyzed into each other nor into some one thing.

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Δ 29

[1] What is said to be FALSE in one way is what is false as a thing, and this [in two ways]:<sup>611</sup> Either [1a] because it is not combined or cannot be combined—as is said, for example, of the diagonal’s being commensurable with the side or of you being seated, since of these the former is always false and the latter sometimes false.<sup>612</sup> Indeed, it is in this way

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that these are not. Or [1b] because, though the things in question are, their nature is either to appear not to be such as they are or to be things that are not—for example, illusionistic painting or dreams.<sup>613</sup> For these are something, but are not the things whose appearance they produce in us. Things are said to be false in these ways, then—either because  
 25 they themselves are not or because the appearance they give rise to is of something that is not.

[2] A false account, insofar as it is false, is of things that are not, which is why every account is false of something other than what it is true of—for example, the account of a circle is false of a triangle.<sup>614</sup> Each thing has in a way one account, that of its essence, and in a way many, since both it itself and it with an attribute are in a way the same (for example,  
 30 Socrates and musical Socrates), whereas a false account is, unconditionally, not the account of anything.<sup>615</sup> That is why Antisthenes was naïve in thinking that nothing could be fairly put into words except by means of the account that properly belonged to it, one to one.<sup>616</sup> From which it follows that there is no such thing as contradicting, and almost that there is no such thing as speaking a falsehood either.<sup>617</sup> But it is possible to put a given thing into words not only by means of the account of itself  
 35 but also by means of the account of something else. This may be done altogether falsely indeed, but also in a way truly—for example, eight is a double number by the account of two.<sup>618</sup>

1025\*1 These things, then, are said to be false in these ways. [3] A false *human being*, on the other hand, is one who readily and by deliberate choice gives false accounts, not because of something else but because of itself, and who produces such accounts in other people, just as we  
 5 say things are false when they produce a false appearance in us.<sup>619</sup> That is why the argument in the *Hippias*, that the same human being is false and true, is misleading.<sup>620</sup> For it assumes that someone is false if he is capable of falsity, that is, the one who knows and is wise, and, furthermore, that someone who voluntarily does base actions is better. This  
 10 false assumption is due to the induction, since someone who limps voluntarily is better than one who does so involuntarily—if by limping is meant pretending to limp, since if someone were *really* lame voluntarily, he would presumably be worse, as in the case of moral character.<sup>621</sup>

## Δ 30

[1] Something is said to be a COINCIDENT when it belongs to something and can be truly said of it, but neither of necessity nor for the most  
 15 part—for example, if someone digging a hole for a plant has found treasure. This—the finding of treasure—is accordingly a coincident of

the one who is digging the hole. For neither does the one of necessity come from the other or after the other, nor, if someone plants, does he for the most part find treasure. Also, a musical person might be pale. But since this does not happen of necessity or for the most part, we say it is a coincidence. So, since there are things that belong and things they belong to, and some of them belong to these only in a particular place or at a particular time, whatever belongs to a subject, but not because it was this subject, or the time this time, or the place this place, will be a coincident.<sup>622</sup> Nor, then, is there a definite cause of a coincidence, but a random one, that is, an indefinite one. Going to Aegina was a coincidence, if someone went not because he set out to visit there but because he was carried off course by a storm or captured by pirates. The coincidence took place, then, or exists but not insofar as it is itself but insofar as it is another thing. For the storm was the cause of his getting to the place to which he was not sailing, and this was Aegina.

[2] Things are said to be coincidents in another way too, namely, whatever belongs to each thing intrinsically but is not in its substance, as, for example, having its interior angles equal to two right angles does to the triangle. And coincidents of this sort may be eternal, whereas no coincident of the other sort is.<sup>623</sup> The account of this is elsewhere.<sup>624</sup>

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5 The starting-points and causes of beings are what we are inquiring  
 into, and clearly qua beings. For there is some cause of health and of  
 good physical condition, and there are starting-points and elements  
 and causes of the objects of mathematics, and in general every science  
 that proceeds by thinking or that has some share in thinking is con-  
 10 cerned with causes and starting-points, whether more exactly or more  
 simply considered.<sup>626</sup> All these sciences, however, mark off a certain  
 being, a certain genus, and busy themselves with it, but not with being  
 unconditionally or qua being, nor do they produce any account of the  
 15 what-it-is.<sup>627</sup> Instead, starting from the what-it-is—some making it  
 clear by means of the perceptual capacities, some getting hold of it as  
 a hypothesis—they in this way proceed to demonstrate the things that  
 belong intrinsically to the genus with which they are concerned, either  
 in a more necessary or in a weaker way.<sup>628</sup> Which is why it is evident  
 from such an induction that there is no demonstration of substance  
 20 nor of the what-it-is, but some other way of making it clear.<sup>629</sup> Similarly  
 too they say nothing as to whether the genus they busy themselves with  
 does or does not exist, because it belongs to the same sort of thinking  
 to make clear both what it is and whether it exists.<sup>630</sup>

But since natural science too is a science concerned with a particular  
 genus (*genos*) of being (for it is concerned with the sort of substance in  
 25 which the starting-point of movement and of rest is internal to itself),  
 it is clear that it is neither a practical science nor a productive one.<sup>631</sup>  
 For in the case of producible things the starting-point is in the pro-  
 ducer, whether this is understanding or craft or some capacity, whereas  
 in the case of things doable in action it is in the doer, namely, deliberate  
 choice. For what is doable in action and what is deliberately choosable  
 are the same. And so if all thought is either practical or productive or  
 30 theoretical, natural science would have to be some sort of theoretical  
 science—but a theoretical science that is concerned with such being as  
 is capable of being moved and with the substance that in accord with  
 its account holds for the most part only, because it is not separable.<sup>632</sup>

But we must not neglect to consider the *way* the essence or its  
 account is, because, without this, inquiry produces no result. Of  
 35 things defined, however, that is, of the "whats" that things are, some

are the way the snub is, others the way the concave is. And these differ because the snub is grasped in combination with the matter (for the snub is a concave *nose*), whereas the concavity is without perceptible matter. If, then, all natural things are said the way the snub is (for example, nose, eye, face, flesh, bone, and, in general, animal, and leaf, root, bark, and, in general, plant—for the account of none of these is without [reference to] movement, but always includes matter), the way we must inquire into and define the what-it-is in the case of natural things is clear, as is why it belongs to the natural scientist to get a theoretical grasp even on some of the soul, that is, on as much of it as is not without matter.<sup>633</sup>

That natural science is a theoretical science, then, is evident from these considerations. Mathematics too is a theoretical one, but whether its objects are immovable and separable is not now clear; however, it is clear that *some* parts of mathematics get a theoretical grasp on their objects insofar as they are immovable and insofar as they are separable.<sup>634</sup> But if there is something that is eternal and immovable and separable, it is evident that knowledge of it belongs to a theoretical science—not, however, to *natural* science (for natural science is concerned with certain movable things) nor to mathematics, but to something prior to both.<sup>635</sup> For natural science is concerned with things that are inseparable but not immovable, while certain parts of mathematics are concerned with things that are immovable and not separable but as in matter.<sup>636</sup> The primary science, by contrast, is concerned with things that are both separable and immovable. Now all causes are necessarily eternal, and these most of all.<sup>637</sup> For they are the causes of the divine beings that are perceptible.<sup>638</sup> There must, then, be three theoretical philosophies, mathematical, natural, and theological, since it is quite clear that if the divine belongs anywhere, it belongs in a nature of this sort.<sup>639</sup> And of these, the most estimable must be concerned with the most estimable genus.<sup>640</sup> Thus, the theoretical are the more choiceworthy of the various sciences, and this of the theoretical.<sup>641</sup>

We might raise a puzzle indeed as to whether the primary philosophy is universal or concerned with a particular genus and one particular nature.<sup>642</sup> For it is not the same way even in the mathematical sciences, but rather geometry and astronomy are concerned with a particular nature, whereas universal mathematics is common to all.<sup>643</sup> If, then, there is no other substance beyond those composed by nature, natural science will be the primary science. But if there is some immovable substance, this [that is, theological philosophy] will be prior and will be primary philosophy, and it will be universal in this way, namely,

because it is primary.<sup>644</sup> And it will belong to it to get a theoretical grasp on being qua being, both what it is and the things that belong to it qua being.

## E 2

But since being is said unconditionally of things in many ways, of which one, we saw, is coincidentally, another as being true, and not being as false, while beyond these there are the figures of predication (for example, what a thing is, quality, quantity, place, time, and anything else that "being" signifies in this way), and beyond these again potential being and active being—since, then, things are said to be in many ways, we must first say about the coincidental sort that there can be no theoretical knowledge about it.<sup>645</sup>

An indication of this is that no science, whether practical, productive, or theoretical, supervises it. For someone who produces a house does not produce all the things that coincide with the house at the time it is coming into being, since these are unlimited in number. For there is nothing to prevent the house he has produced from being pleasant to some, harmful to others, and beneficial to others, and from being distinct from (one might almost say) all other beings.<sup>646</sup> But the craft of building is not productive of any of these. In the same way, a geometer does not get a theoretical grasp on what is in this fashion coincidental to his figures, nor whether a triangle and a triangle having interior angles equal to two right angles are distinct.<sup>647</sup> And this happens quite reasonably, since "coincidental" is like "in name only."<sup>648</sup>

That is why Plato was in a way not wrong when he classified sophistic as being concerned with what is not.<sup>649</sup> For the arguments of the sophists are above (one might almost say) all else concerned with the coincidental—for example, whether musical and grammatical, or musical Coriscus and Coriscus, are distinct or the same, or whether everything that is, but is not always, has come to be, so that if someone who was musical has come to be grammatical, he must also have been grammatical and come to be musical, and all the other arguments of this sort.<sup>650</sup> For what is coincidental is evidently somewhat close to what is not. As is also clear from arguments such as this: with things that are in another way there is coming to be and passing away, but with things that are coincidentally there is not.<sup>651</sup>

Nonetheless, where the coincidental is concerned we must, as far as possible, say further what its nature is and due to what cause it exists, since it will presumably also be clear at the same time why there is no science of it.

Since, then, of the beings, some are always and of necessity the way they are (not in the sense in which we say that something is forced but in the sense in which we say that it does not admit of being otherwise), while others are the way they are neither of necessity nor always but for the most part—*this* is [the] starting-point and this the cause of the existence of the coincidental.<sup>652</sup> For what is neither always nor for the most part—that is what we say is coincidental. For example, if in the dog-days we have storm and cold, we say that it is a coincidence, but not if we have stifling heat, because the latter occurs always or for the most part, the former not.<sup>653</sup> Also, that the human is pale is coincidental (for this is neither always nor for the most part so), but he is not an animal coincidentally. And that the builder cures someone is coincidental, because it is not the builder who naturally does this but the doctor—but the builder was by coincidence a doctor. And the gourmet cook, aiming to give pleasure, might produce something healthy, but not in accord with the craft of gourmet cooking.<sup>654</sup> That is why it was a coincidence, we say, and in a way he produces it, but not unconditionally. For of other things there are sometimes capacities that are productive of them, whereas of some there is no definite craft or capacity.<sup>655</sup> For of things that are or come to be coincidentally the cause too is coincidentally a cause.

And so since not all things either are or come to be of necessity and always, but most are for the most part, what is coincidentally must of necessity exist—for example, a pale human is neither always nor for the most part musical, but since this happens sometimes, it will be coincidentally—otherwise everything will be of necessity. And so the matter, which is capable of being otherwise than it for the most part is, will be the cause of the coincidental.<sup>656</sup>

We must grasp this starting-point [when we ask] whether there is nothing that is neither always nor for the most part or whether this is impossible.<sup>657</sup> There is, in that case, something beyond these, namely, what is so by luck and coincidentally.<sup>658</sup> But while it belongs to some things to be for the most part, does it belong to none to be always, or is there something eternal? Well, these topics will have to be investigated later.<sup>659</sup> But that there is no scientific knowledge of the coincidental is evident. For all scientific knowledge is either of what always is or of what for the most part is.

For how else could one learn, or teach someone else?<sup>660</sup> For a thing must be defined either by what is always so or by what is for the most part so—for example, that honey-water is beneficial to a fever-patient for the most part. But the exceptions to this cannot be stated, I mean, the times when this does not happen—for example, on the day of the new moon.<sup>661</sup> For it is either always or for the most part that even what

happens on the day of the new moon happens. But the coincidental is an exception to that.

We have said, then, what the coincidental is, and due to what cause, and that there is no scientific knowledge of it.

### E 3

It is evident that there are starting-points and causes that can come to be and pass away without going through a process of *coming* to be and *passing* away, since otherwise everything will be of necessity—if whatever is coming to be and passing away must have something that is non-coincidentally its cause.<sup>662</sup> Will *this* be or won't it? It will if *this* comes to be; but if not, it won't. And this will if something else does. And in this way it is clear that, since time is always being subtracted from a limited period of time, we will come to the present moment.

Thus, this person will die by violence if he goes out; and he will do this if he gets thirsty; and he gets thirsty if something else; and in this way we shall come to what [attributes] belong to him now, or to something that has come about—for example, if he gets thirsty, and he does so if he is eating something spicy.<sup>663</sup> And this [attribute] either belongs to him or it does not. And so of necessity he will die, or of necessity not die. Similarly too if we jump over to what has come to be, the same argument applies. For this [attribute]—I mean the one that has come to be—already belongs in something, so that everything that will be will be of necessity. For example, that the one who is living dies. For already something has come to be—for example, the presence of contraries in the same thing.<sup>664</sup> But whether by disease or violence is not yet [necessary], but [will be] if this comes about. It is thus clear that it goes back as far as some starting-point, but this one no longer goes back to something else. This, then, will be the starting-point of what happens by luck, and nothing else will be the cause of its coming to be.

But to what sort of starting-point and to what sort of cause we are in this way referred, whether to matter or to the for-the-sake-of-which or to what sets things moving, must be investigated to the fullest extent.<sup>665</sup>

### E 4

So much for being coincidentally. It has been made sufficiently determinate. As for being as being true and not being as being false, they have to do with combination and division, and together have to do with the allocation of a contradictory pair.<sup>666</sup> For truth has affirmation in



the case of what is combined and denial in the case of what is divided, while falsehood has the contradictory of this allocation. (The way that understanding things at the same time or separately comes about requires another account, but I mean "at the same time" versus "separately" to imply that what comes about is not a succession of things but a single thing.<sup>667</sup>) For falsehood and truth are not in the things, as if the good were true and the bad straightaway false, but in thought, and with regard to simple things and the what-it-is-es, not even in thought. Since all this is so, what should be done to get a theoretical grasp on this way of being and not being must be investigated later.<sup>668</sup>

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But since the connection and division are in thought and not in the objects, being in this way is a different thing from being in the full way (since thought joins or subtracts either the what-it-is or a quality or a quantity or whatever else it may be), being coincidentally and being as being true may be left aside.<sup>669</sup> For the cause of the former is indefinite, while that of the latter is a certain attribute of thought, and both are concerned with the remaining genus of being, and do not make clear any nature of being as external.<sup>670</sup> Because of that we may leave them aside and investigate being itself and its causes and starting-points qua being.

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1028<sup>a</sup>1

It is evident in our discussions of the various ways in which things are said to be that they are said to be in many ways.

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## BOOK ZETA (VII)

### Z I

10 Something is said to be in many ways, which we distinguished earlier in our discussion of the many ways.<sup>671</sup> For on the one hand "being" signifies the what-it-is and a this something, and on the other quality, quantity, or one of the other things predicated as these are.<sup>672</sup> But while things are said to be in this many ways, it is evident that primary among these is the what-it-is, which is just what signifies the substance.<sup>673</sup> For when  
15 we say how this thing is qualified, we say that it is good or bad, but not that it is three cubits or a human, whereas when we say what it is we do not say pale or hot or three cubits, but a human, or a god. And the other things are said to be, some by being quantities of what is a being in this way, others qualities, others affections, others something else of this sort.

That is why someone might indeed be puzzled about whether walking and being healthy and sitting are each of them a being or not a being, and similarly too in the case of any other thing of this sort.<sup>674</sup> For none of these is either by its nature intrinsically a being or capable of being separated from substance but, if anything, it is the walking thing that is a being, and the sitting thing, and the one being healthy.<sup>675</sup> These  
25 things are evidently beings to a higher degree, because there is some definite underlying subject for them (and this is the substance and the particular), which is just what is made apparent in this sort of predication.<sup>676</sup> For good and sitting are not so said without this. It is clear, then, that it is because of this that each of these other things *is* as well, so that what primarily is—not is something [else] but is uncondition-  
30 ally—will be substance.<sup>677</sup>

Now things are said to be primary in many ways. Nonetheless, substance is primary in all of them—in account, in knowledge, and in time.<sup>678</sup> For of the various things that are predicated none is separable, but only this.<sup>679</sup> And in account too it is primary, since in the account  
35 of each thing its account is necessarily present as a component. And we think we know each thing most of all, when we know, for example, what a human is, or fire, rather than when we know the quality or the quantity or the place, since of these things themselves also we know each one when we know, for example, what the quantity or the quality is.  
1028<sup>b1</sup>

Indeed, the question that was asked long ago, is now, and always will be asked, and is always giving rise to puzzles—namely, What is

being?—is just the question, What is substance? (For this is what some people say is one, others more than one, some that it is a limited number, others an unlimited one.<sup>680</sup>) And that is why we too must most of all, primarily, and (one might almost say) exclusively get a theoretical grasp on what it is that is a being in this [substantial] way.

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## Z 2

Now substance seems to belong most evidently to bodies. That is why we say that animals and plants and their parts are substances, and also natural bodies, such as fire, water, earth, and each thing of this sort, as well as such things, whether all or some, as are parts of these or from which they are composed (for example, the heaven and its parts, stars and moon and sun), but whether these alone are substances, or others as well, or some of these and some others as well, or none of these but some others, is something that must be investigated.<sup>681</sup>

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It seems to some people that the limits of body—for example, surface, line, point, and unit—are substances, and more so than body and solid.<sup>682</sup> Further, some do not think that beyond the perceptible things there is anything of that sort, whereas others think that there are more [substances than that] and that they are beings to a higher degree, because they are eternal. Thus Plato thought that the Forms and the objects of mathematics were two sorts of substances, and that the substance of perceptible bodies was a third.<sup>683</sup> And Speusippus thought that there were even more substances, starting from the one, as well as starting-points for each sort of substance, one for numbers, another for magnitudes, and then another for the soul.<sup>684</sup> And by going on in this way he multiplies the substances. And some say that the Forms and the numbers have the same nature, and that the others—lines and planes—follow after them, right up to the substance of the heaven and the perceptibles.<sup>685</sup>

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Concerning these topics, then, what is said correctly or incorrectly—that is, which things are substances, and whether there are any beyond the perceptible ones or not, and the way these latter ones are, and whether there is any substance that is separate, and if so why and in what way, or whether there is none beyond the perceptibles—must be investigated. But first we must give a sketch of what substance is.<sup>686</sup>

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## Z 3

Something is said to be substance, if not in more ways, at any rate most of all in four. For the essence, the universal, and the genus seem to be the substance of each thing, and fourth of these, the underlying subject.

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The underlying subject is that of which the other things are said, but which is itself not further said of any other thing, which is why we must first make some determinations about it. For the primary underlying subject seems most of all to be substance.<sup>687</sup>

Well, in one way the matter is said to be a thing of this sort, in another way the shape, and in a third what is composed of these. (By the matter I mean, for example, the bronze; by the shape, the configuration of the form as it is presented to sight; and by what is composed of these, the statue—the compound.<sup>688</sup>) And so if the form is prior to the matter and more of a being, it will also be prior to what is composed of both of them, for the same reason.<sup>689</sup>

It has now been said in outline what substance is, namely, what is not said of an underlying subject, but of which the other things are said. But we should not say only this, since it is not enough. For it itself is unclear, and furthermore the matter becomes substance. For if this is not substance, it escapes us what else is. For when the others are stripped away, we do not see anything remaining. For—whereas the others are affections, products, and capacities of bodies—length, breadth, and depth are quantities and not substances (for the quantity is not substance). Rather, that primary thing to which these belong, *that* is substance. But when length, breadth, and depth are stripped away, we see nothing left, unless it be something that is given definition by these, so that the matter alone must appear to be substance for those who investigate in this way.<sup>690</sup> (By matter I mean that which, intrinsically, is neither said to be a something, nor a quantity, nor anything else by which being is given definition.<sup>691</sup> For there is something that each of these is predicated of, whose being is distinct from that of each of the things predicated. For while the other things are predicated of the substance, this is predicated of the matter.<sup>692</sup> And so the last thing [in this series] will not be intrinsically a something, or a quantity, or anything else—nor indeed is it the denials of these, since they too will belong to it coincidentally.<sup>693</sup>)

Well then, for those who try to get a theoretical grasp on things in this way, the matter turns out to be substance. But this is impossible. In fact both separability and being a this something seem to belong most of all to substance, and, because of this, the form and the thing composed of both would seem to be substance more than the matter is.<sup>694</sup> But the substance that is composed of both (I mean of both the matter and the shape) should be set aside. For it is posterior, and evident. And the matter too is in a way evident.<sup>695</sup> But the third must be investigated. For it is the most puzzling. It is agreed, though, that some perceptibles are substances, and so it is among these that it should first be looked for.

{For it advances the work to proceed toward what is more knowable. 3  
 For learning comes about for all in this way—through things by nature  
 less knowable toward ones that are more knowable.<sup>696</sup> And just as with 5  
 things in the sphere of action the work is to begin from things that are  
 good for each particular person and make things that are wholly good  
 good for each particular person, so too the work here is to begin from  
 things more knowable to oneself and make the ones that are by nature  
 knowable knowable to oneself.<sup>697</sup> But the things that are knowable and  
 primary for particular groups of people are often only slightly know-  
 able and have little or nothing of the being in them.<sup>698</sup> Nonetheless, 10  
 beginning from things that are poorly known but known to ourselves,  
 we must try to know the ones that are wholly knowable, proceeding, as  
 has just been said, through the former.}<sup>699</sup>

#### Z 4

Since at the start we determined in how many ways we define sub- 1029<sup>a</sup>  
 stance, and of these one seemed to be the essence, we must get a the-  
 oretical grasp on it.<sup>700</sup> And first let us say some things about it in a  
 logico-linguistic way, because the essence of each thing is what it is 13  
 said to be intrinsically.<sup>701</sup> For the being for you is not the being for  
 musical.<sup>702</sup> For you are not intrinsically musical. [Your essence], there-  
 fore, is what you are [said to be] intrinsically. 15

But not, certainly, all of this. For what is intrinsic in this way is not  
 so in the way that pale is to surface, because the being for a surface  
 is not the same as the being for pale. But neither is it the being that  
 is composed of both, namely, the being for a pale surface. Why?<sup>703</sup>  
 Because surface itself is added. Hence the account in which the thing  
 itself is not present, but it itself is said, this is the account of the essence  
 for each thing.<sup>704</sup> And so if the being for a pale surface is the being for 20  
 a smooth surface, then the being for pale and for smooth will be one  
 and the same.

But since there are composites in accord with the other catego-  
 ries too (for there is some underlying subject for each—for example,  
 for the quality, the quantity, the time, the place, and the movement),  
 whether there is also an account of the essence for each of these must 25  
 be investigated, and whether the essence belongs to them as well—for  
 example, to pale human.<sup>705</sup> Let us, then, give this the name “cloak.”  
 What is the being for a cloak? But then this is not one of the things said  
 to be intrinsically either. Or, are things said “intrinsically not to be”  
 in two ways, one being from an addition and the other not.<sup>706</sup> For in 30  
 one case what is being defined is said to be by being added to another

thing—for example, if someone defining the being for pale were to state the account of pale human; in the other case, what is being defined is said to be by another thing not being added to it—for example, if the cloak signified pale human, but someone were to define the cloak as pale.<sup>707</sup> (The pale human is indeed something pale in that case, but not, surely, what being for pale was.<sup>708</sup>)

But [what about] the cloak? Is the being for it an essence at all? Or not? For the essence is just what something is.<sup>709</sup> But when one thing is said of another, it is not just a this something—for example, the pale human is not just a this something, if indeed the “this” belongs only to substances.<sup>710</sup> And so there will be an essence only of those things whose account is a definition.<sup>711</sup> We have a definition, however, not when a name and an account signify the same thing (for then all the accounts would be definitions, since there will be a name answering to any account whatever, so that even the *Iliad* will be a definition), but when the account is of something primary; and primary things are those that are said *not* by way of saying one thing of another.<sup>712</sup> Hence the essence will belong to things that are species of a genus and to nothing else.<sup>713</sup> For these seem not to be said by way of participation and by way of being an attribute, or in a coincidental way.<sup>714</sup> But there will be an account of each of the other things too and what it signifies, [stating] if it is a name, that this belongs to this, or, instead of a simple account, a more exact one. There will not, however, be a definition or an essence.

Or is something said to be the definition in many ways too, just like the what-it-is? For in fact the what-it-is signifies in one way the substance and the this something, and in another way it signifies each of the other things that are predicated—quantity, quality, and the like. For just as *is* (*to estin*) also belongs to all of them, but not in the same way, but to one in a primary way and to the others in a derivative one, so too the what-it-is belongs unconditionally to the substance and in a way to the others. For we can also ask what quality is, and so quality too is something with a what-it-is—but not unconditionally. Rather, just as in the case of what is not (*to mê on*), some people say in a logico-linguistic way that what is not is (not that it is unconditionally but that it is what is not), so too with the quality.

We must, then, also investigate how we should speak about each of them, but not more than how the thing in fact is.<sup>715</sup> That is why now too, since what is said is evident, it is also evident that the essence will belong in a similarly primary and unconditional way to the substance, and derivatively to the others, just as with the what-it-is—not the unconditional essence, but the essence for a quality, or for a quantity.

For it must either be homonymously that we say that these things are beings, or by adding something or by subtracting something, just as what is not scientifically known is scientifically known.<sup>716</sup> (For what is correct, surely, is that they are said [to be] neither homonymously nor in the same way, but as with "medical," with reference to one and the same thing—not saying one and the same thing, but not speaking homonymously either. For a patient, a function, and an implement are said to be medical neither homonymously nor in accord with one thing but rather with reference to one thing.<sup>717</sup>) But whichever of the two ways we propose to say that these things [are beings] makes no difference. This, however, is evident: that in the primary and unconditional way definition and the essence belong to substances. Not that they do not also equally belong to the other things, except not in the primary way.

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For it is not necessary, if we accept this view, for there to be a definition of this sort whenever a name signifies the same thing as an account, but rather the same thing as an account of a certain sort, and this occurs if it is of something that is one—not by continuity, like the *Iliad*, and not in the way in which things are one by being tied together, but one in the ways in which things are said to be one.<sup>718</sup> But things are said to be one as they are said to be, and being signifies on the one hand the this something and on the other some quality or quantity. That is why there will be an account of pale human and a definition, but in another way than there is of pale and of substance.

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## Z 5

There is a puzzle, though, if we deny that an account composed from an addition is a definition, as to whether there will be a definition of any of the things that are not simple but coupled.<sup>719</sup> For these must be made clear by an addition. I mean, for example, there is nose *and* concavity, and snubness is what is said of things composed of both, as *a this in this*.<sup>720</sup> And it is not *coincidentally* that the concavity or the snubness is an attribute of the nose but intrinsically—not in the way that the pale is of Callias, or of a human (namely, because Callias, who is coincidentally a human, is pale) but in the way that the male is of the animal, or the equal of the quantity, and in the way all things are that are said to belong to something intrinsically.<sup>721</sup> These are the ones in which either the account belongs or the name of what this is the attribute of, and which cannot be made clear separately, in the way that the pale can be made clear without the human, but not the female without the animal. And so either there is no essence or definition of any of these [coupled] things, or, if there is, it is in another way, just as we said.<sup>722</sup>

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But there is also another puzzle about these things. For if snub nose is the same as concave nose, then the snub and the concave will be the same. But if they are not the same (because it is impossible to say the snub without saying the thing of which it is an intrinsic attribute, since the snub is concavity in a nose), then it must either be impossible to say the snub nose, or the same thing will be said twice, namely, concave nose nose (for the snub nose will be the concave nose nose). That is why it is absurd that the essence should belong to things like this.<sup>723</sup> If it does, it will go on without limit. For in snub nose nose there will be yet another one.

It is clear, therefore, that only of substance is there a definition. For if there was also a definition of the other things that are predicated, it would necessarily be composed from an addition, like that of odd, for it is not definable without number, or female without animal. (By "addition" I mean the cases in which it turns out that the same thing is said twice.)

But if this is true, then things that are coupled—for example, odd number—will not have a definition either (but this escapes notice because their accounts do not describe them in an exact way). But if there are definitions of these as well, then either it must be in another way or, as we mentioned, things must be said to be the definition and the essence in many ways, so that in one way there will not be any definition or any essence that belongs to anything except the substances, and in another way there will.

It is clear, then, that the definition is the account of the essence, and that the essence is either of the substances alone, or of them most of all and primarily and unconditionally.

## Z 6

But whether each thing and its essence are the same or distinct must be investigated. For this will advance the work relating to the investigation concerning substance. For each thing seems to be nothing other than its own substance, and the essence is said to be the substance of each thing.

Well then, in the case of things said coincidentally they would seem to be distinct—for example, a pale human seems to be distinct from the being for a pale human. For if they were the same, the being for human and for pale human would be the same.<sup>724</sup> For a human and a pale human are the same, as they say, so that the being for a pale human and for a human would be the same too.<sup>725</sup> Or is there no necessity for things that are coincidentally [the same] to be the same? For the



extreme terms do not become the same in the same way.<sup>726</sup> But perhaps *this* might seem to follow, namely, that the extreme terms would be the same coincidentally—for example, the being for pale and the being for musical.<sup>727</sup> But it seems not to follow.

In the case of things that are said to be intrinsically, however, is it necessary that the thing be the same [as its being or essence]?<sup>728</sup> For example, if there are some substances to which no substances or any other natures are prior, of the sort that some people say the Ideas are?<sup>729</sup> For if the good-itself and the being for a good are distinct, also animal [-itself] and the being for an animal, also the being for a being and being, then there will be other substances and natures and Ideas beyond those that were mentioned, and these other substances will also be prior, if the essence is substance. And if the two are detached from each other, then there will be no scientific knowledge of the former ones, while the latter ones will not be beings.<sup>730</sup> (By “detached from each other” I mean if the being for a good neither belongs to the good-itself nor being good to the being for a good.<sup>731</sup>) For there is scientific knowledge of each thing when we know its essence. And what holds in the case of the good holds equally for the others, so that if not even the being for good is a good, then neither will the being for a being be a being nor will the being for one be a one. Similarly, either all the essences are, or none of them are, so that if not even the essence for a being is a being, then none of the others is either. Further, that to which the essence for a good does not belong is not a good.

The good, then, is necessarily one with being for a good, and similarly beauty and being for a beauty, and so with all things that are not said to be with reference to something else but are intrinsic and primary. For it is in fact enough if this feature belongs to them, even if they are not Forms, but more so, presumably, if they are Forms. At the same time, however, it is also clear that if indeed the Forms are as some people say they are, the underlying subject will not be substance. For the Forms are necessarily substances, but not by being [predicated of] an underlying subject. For then they will be by being participated in.

On the basis of these arguments, then, each thing itself and its essence are one and the same, and not in a coincidental way, and because to scientifically know each thing is just to scientifically know its essence, so that even by *ekthesis* the two must be one and the same.<sup>732</sup>

On the other hand, of what is said to be coincidentally, for example, the musical or the pale, because it has a double signification, it is not true to say that it and its essence are the same. For what the coincident belongs to is pale as is the coincident, so that in one way it and its

essence are the same, and in another not the same. For the pale is not the same as the human, that is, as the pale human, but it is the same as the attribute pallor.

An absurdity would become apparent if we assigned a name to each of the essences. For beyond this original one, there will be another—for example, for the essence of a horse there will be another essence for a horse. Yet what is to prevent, even as things stand, some things from being their essences straightaway, if indeed the essence is substance?<sup>733</sup> But then, not only are they one, but also the accounts of them are the same, as is clear also from what has been said. For it is not coincidentally that one and the being for one are the same. Further, if they are distinct, it goes on without limit. For on the one hand there will be an essence for the one and on the other hand there will be the one, so that the same argument will apply to these as well.<sup>734</sup>

It is clear, then, that in the case of the things that are primary and that are said to be intrinsically, the being for each is one and the same as the thing. And it is evident that sophistical refutations of this thesis are to be resolved using the same resolution as in whether Socrates and the being of Socrates are the same.<sup>735</sup> For there is no difference either in the materials on the basis of which we would raise our questions or in those on the basis of which we would find a resolution of them.

We have said, then, in what way the essence of each thing is the same as the thing, and in what way it is not the same.

### Z 7<sup>736</sup>

Of things that come to be, however, some do so by nature, some by craft, and some from chance, but they all come to be both as a result of (*hupo*) something and of or from (*ek*) something, and they all come to be something (*ti*)—the “something” I mean may be of any category, since things come to be a this, or of some quality, or of some quantity, or somewhere.<sup>737</sup>

The natural comings to be are those of the things whose coming to be is from (*ek*) a nature. What they come to be of (*ek*) is what we call matter; that as a result of which they come to be is something that is by nature a being; and the something they come to be is a human or a plant or something else of this sort, which we say are substances most of all. And all the things that come to be either by nature or by craft have matter. For each of them is capable both of being and of not being, and this is the matter in each. In universal terms, then, that “from (*ek*) which” is a nature, and that “in accord with which” is a nature (for what comes to be has a nature, for example, a plant or an animal), and also

that "as a result of which." This is the one that is said to be the nature that is in accord with the form, which is the same in form [as what comes to be], but in another thing—for human begets human.

That, then, is the way things come to be that come to be because  
 of a nature. The other comings to be are called *productions*. And all  
 productions come either from (*apo*) craft, or from some capacity, or  
 from thought. Some of them, however, may come about from chance  
 or from luck, in a way quite similar to the ones found in those that  
 come to be from a nature.<sup>738</sup> For sometimes there too some of the  
 same things come to be either from (*ek*) seed or without seed.<sup>739</sup> But  
 we must investigate these later.<sup>740</sup> From craft, though, come to be the  
 things whose form is in the soul. And by form I mean the essence of  
 each thing and the primary substance.<sup>741</sup> For even contraries in a way  
 have the same form. For the opposing substance is the substance of the  
 lack. For example, health is the substance of disease, since it is by its  
 absence that disease is made clear.<sup>742</sup> And health is the account in the  
 soul and the scientific knowledge. So what is healthy comes to be when  
 one has understood as follows: Since this is what health is, necessarily  
 if the thing is to be healthy, this must be present—for example, a uni-  
 form state—and if the latter is to be present, there must be heat, and  
 the doctor goes on, always understanding in this way, until he is led to  
 a final this that he himself is able to produce.<sup>743</sup> Then the movement  
 from this point onward is called a production—the one that leads to  
 being healthy.<sup>744</sup> And so it turns out that in a way health is produced  
 from (*ek*) health, and a house from (*ek*) a house, the one that has mat-  
 ter from (*ek*) the one without matter. For the craft of medicine and the  
 craft of house-building are the form of health and of a house. By the  
 substance without matter I mean the essence.

Of comings into being and movements, one part is called under-  
 standing and the other producing—what proceeds from the starting-  
 point and form is understanding, what proceeds from the final stage  
 of understanding is producing. And each of the other things—the ones  
 in between—comes to be in the same way. I mean, for example, if he  
 is to be healthy, he must be made uniform. But what is it to be made  
 uniform? This. And it will come about if he is made warm. And what  
 is it to be made warm? This. And it is present potentially; and for it to  
 be actually present is up to [the doctor] himself. What produces, then,  
 and what the process of becoming healthy starts from, if it is from craft,  
 is the form in the soul, but if it is from chance, it is from whatever it  
 is that is a starting-point of producing for what produces from craft.  
 For example, in the case of healing the starting-point is presumably  
 from the warming, which the doctor produces by rubbing. Warmth in

the body, therefore, is either a part of health or else something similar that is part of health follows it, either immediately or by way of several steps, and this last thing that produces health is in this way a part of health, and of a house (the stones, for example), and similarly of other things.<sup>745</sup> And so, as is said, coming to be is impossible if there is nothing preexisting.<sup>746</sup>

Indeed, that some part must be present is evident. For the matter is a part, since it is this that is present within the thing and comes to be something. But is it also one of the things in the account? Well, we do speak in both ways when we say what brazen circles are, speaking of the matter when we say that it is bronze, and of the form when we say that it is a shape of such-and-such sort (shape being the genus in which it is first placed). The brazen circle, then, does have the matter in its account.<sup>747</sup>

As for that from (*ek*) which, as matter, they come to be, some, when they have come to be, are said not to be *that* but *thaten*—for example, a statue is not said to be stone, but stonen.<sup>748</sup> The human being who is healthy, by contrast, is not said to be of that from which (*ek*) he comes.<sup>749</sup> The cause of this is that although he comes to be from (*ek*) both the lack and from (*ek*) the underlying subject, which we call the matter (for example, it is both the human and the sick that come to be healthy), it is rather from (*ek*) the lack, nevertheless, that he is said to come to be—for example, healthy comes from (*ek*) sick rather than from (*ek*) human. That is why the healthy one is not said to be sick, but is said to be human, and the human is said to be healthy. In cases where the lacks are unclear or nameless, however, such as the lack of whatever shape it happens to be in bronze, or that of a house in bricks and timbers, the thing seems to come to be from (*ek*) these materials as in the previous case it did from being sick.

That is why, just as in that previous case the thing is not said to be what it is from, so in these cases too the statue is not said to be wood (*xulon*), but by derivation, wooden (*xulinos*), and brazen, not bronze, and stonen, not stone, and the house is said to be bricken but not bricks. But it is not the case either that a statue *comes to be* from (*ek*) wood, or a house from (*ek*) bricks, since if someone looked intensely, he would not say this unconditionally, because what something comes to be from (*ek*) must change, and not remain. That, then, is why we speak in this way.

## Z 8

Since what comes to be, comes to be as a result of something (by which I mean the starting-point of the coming to be) and from (*ek*)

something (and let this be not the lack but the matter; for we have already determined the way in which we say this) and comes to be something (and this is either a sphere or a circle or whichever of the others it happens to be), just as the producer does not make the underlying subject (the bronze), so he does not make the sphere either, except coincidentally, because the brazen sphere is a sphere and he does make the former.<sup>750</sup> For to make the this something is to make a this something from (*ek*) what is wholly the underlying subject.<sup>751</sup>

I mean that to make the bronze round is not to make the round or the bronze but a distinct thing, namely, this form in something else. For if the producer makes something, he must make it from (*ek*) something else (for we assumed this).<sup>752</sup> For example, he makes a brazen sphere, but in such a way that from (*ek*) this, which is bronze, he makes this, which is a sphere. If, then, he also made this [matter] itself, it is clear that he will make it in the same way, and the productions will go on without limit.

It is evident, therefore, that neither does the form—or whatever we ought to call the shape that is in the perceptible thing—come to be, nor is there any process of coming to be of it, and the essence does not come to be either (for it is this that comes to be in something else, whether as a result of craft or as a result of nature or of some capacity).<sup>753</sup> But the producer does make a brazen sphere to exist. For he produces it from (*ek*) bronze and sphere. For in this specific thing he produces this specific form, and the result is a brazen sphere.<sup>754</sup> But if there is going to be a coming to be of the being of sphere in general, then it will have to be a something [that comes to be] from (*ek*) something. For whatever is coming to be must always be divisible, and be on the one hand *this* and on the other *this*. I mean, that it must be on the one hand the matter and on the other the form. If, then, a sphere is the shape that is equidistant from its center, then one component of this is that in which what the producer makes will be, and the other is what will be in that one, and the whole thing is what has come to be—for example, the brazen sphere. It is evident, then, from what has been said, that what is said to be the substance as form does not come to be, but that the compound that is said with reference to this, does come to be, and that in everything that comes to be matter is present, and that it is on the one hand *this* and on the other *this*.<sup>755</sup>

Is there, then, any sphere beyond these ones, or any house beyond the one of bricks?<sup>756</sup> Or would there never have been any coming to be of any this something if there were? But sphere or house signifies

such-and-such sort of thing, not a this and a definite thing, and a maker makes or begets from (*ek*) this [matter], such-and-such sort of thing, and when it has come to be, it is this thing of such-and-such sort. And the whole this—for example, Callias or Socrates—is like this brazen sphere, while the animal and the human are like brazen sphere in general.<sup>757</sup>

It is evident, therefore, that the cause consisting of the Forms (if these are the way some people are accustomed to say the Forms are, namely, things beyond the particulars) is of no use, at any rate where comings to be and substances are concerned, and they would not be intrinsically substances because of *these*.

In some cases indeed it is even evident that the begetter is of this same sort as the begotten (not that they are the same thing, certainly, nor one in number, but one in form)—for example, in the case of natural things. For human begets human—unless something is begotten contrary to nature, as when a horse begets a mule.<sup>758</sup> (And even these are similar. For what would be common to both horse and donkey, the closest genus, does not have a name, but would presumably be both, like a mule.) And so it is evident that there is no need to fabricate a Form as a paradigm (for it was in the case of natural things that Forms were looked for most of all, since these are most of all substances), rather, the begetter is sufficient to produce the thing, and is the cause of the form's being in the matter. And once we have the whole, such-and-such sort of form in this flesh and bones, this is Callias or Socrates. And they are distinct because of their matter (for that is distinct), but the same in form (for the form is indivisible).<sup>759</sup>

## Z 9

But we might raise a puzzle as to why it is that some things come to be both by craft and by chance (for example, health), whereas others do not (for example, a house).<sup>760</sup> The cause is that the matter that serves as the starting [-point] of the process of coming to be in some cases of producing something, or of something's coming to be by craft, and that has some part of the thing present in it, is of [1] a sort that can be moved by itself, whereas in others [2] it is not; and, of the former sort of matter, [1a] some can be moved in the particular way required, whereas [1b] some is incapable of it (for many things are capable of being moved by themselves but not in the particular way required—for example, so as to constitute dancing).<sup>761</sup> The things, then, whose matter is of [1b] the latter sort—for example,

stones—cannot be moved in the particular way required except by something else, although they can in another way, as can fire.<sup>762</sup> That is why some things will not exist without someone possessing the relevant craft, whereas others will exist. For movement will be started by those things that do not possess the craft but can be moved by other things that do not possess the craft either, or else from a part [of the product].

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It is clear from what has been said that in a way all things come to be from something with the same name, just as in the case of the ones that do so by nature, or from a part with the same name (for example, the house from a house, insofar as it is as a result of understanding, since the craft is the form), or from what has some part of [what comes to be]—that is, if it does not come to be coincidentally.<sup>763</sup> For the primary cause of the production, the intrinsic one, is a part [of the product]. For warmth in the [rubbing] movement produced warmth in the body, and this either is health or a part of it, or a part of health follows it or health itself does. And that is why it is said to produce the health—because it produces that which the health follows and with which it coincides. And so, just as in the deductions, the substance is the starting-point of all, since it is from the what-it-is that the deductions come, and from there too the comings to be.<sup>764</sup>

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Things composed by nature also have a similarity to these others. For the seed is a producer in the same way as the things that are from craft, since it has the form potentially.<sup>765</sup> And what the seed comes from in a way has the same name [as the offspring], except where there is a disability.<sup>766</sup> For we should not look for all offspring to come to be in the same way as human does from human, since even woman comes from man.<sup>767</sup> That is why, too, a mule does not come from a mule.

1034<sup>b1</sup>

Natural things that come to be by chance, like the ones there [in the crafts], are those whose matter can also be moved by itself with the same movement as the seed moves it. But those whose matter is not capable of this cannot come to be in any other way than from those things [from which they come to be].

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It is not only where the substance is concerned that our account makes clear that the form does not come to be, but also where all the primary things are concerned the account is equally applicable—for example, to quantity, quality, and the other categories.<sup>768</sup> For just as the brazen sphere comes to be but not sphere or bronze, and [the sphere] comes to be in the bronze (for the matter and the form must always be preexistent).<sup>769</sup> That is the way it is too in the case of the what-it-is,

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of the quality and quantity, and similarly of the other categories. For the quality does not come to be, but wood of that quality, nor does the quantity, but wood or animal of that quantity. And what we grasp from these cases as special to the substance is that it is necessary for there always to preexist another substance, which is actual, to produce it (for example, an animal if an animal is what comes to be), whereas for quality or the quantity this is not necessary, except potentially.<sup>770</sup>

Z 10<sup>771</sup>

Since, however, a definition is an account, and every account has parts, and as the account is to the thing, so the part of the account is to the part of the thing, a puzzle already arises as to whether the account of the parts needs to be present in the account of the whole or not.<sup>772</sup> For in some cases they evidently are present, but in some not. For the account of the circle does not contain that of the segments, whereas that of the syllable does contain that of the phonetic elements. And yet the circle also divides into the segments just as the syllable divides into the phonetic elements.

Further, if the parts are prior to the whole, and the acute angle is part of the right angle and the finger is part of the animal, the acute angle will be prior to the right angle and the finger to the human. But the wholes seem to be prior. For in the account the parts are described in terms of the wholes, which are also prior with respect to being without each other.<sup>773</sup>

Or perhaps something is said to be a *part* in many ways. Of these, one way is: what measures with respect to quantity.<sup>774</sup> But this we may set aside. On the other hand, the things from which the substance is composed as parts—this [way of being a part] must be investigated. If, then, there is the matter, the form, and what is composed of them, and the matter, the form, and what is composed of them are substance, then there is a way in which even the matter is said to be a part, and a way in which it is not, but parts are rather the things of which the account of the form is composed. For example, of the concavity flesh is not a part (for this is the matter in which it comes to be), but of the snubness it is a certain part.<sup>775</sup> And of the compound statue the bronze is a part, but of what is said to be a statue as form it is not a part.<sup>776</sup> For each thing may be said to be the form, or the thing insofar as it has the form, but may never be said to be intrinsically the material component.<sup>777</sup>

That is why the account of the circle does not contain that of the segments, whereas that of the syllable does contain that of the phonetic



elements. For the phonetic elements are parts of the account of the form, and are not matter, whereas the segments are parts in this way, namely, as matter in which the form comes to be—although they are closer to the form than the bronze is to the circle when circularity comes to be in bronze.<sup>778</sup> But there is a way in which not even all the elements will be present in the account of the syllable—for example, these here in the wax or the ones [that are movements] in the air. For these too are already part of the syllable as perceptible matter. For even if the line, when divided, passes away into the halves, or the human into the bones, sinews, and flesh, it is not the case that because of this they are composed of these as being parts of the substance, but rather as from matter; and of the compound, they are parts, but of the form and what the account is of they are not parts at all.<sup>779</sup> That is why they are not in the accounts either.<sup>780</sup>

In the account of some things, then, the account of the parts that are such as these will be present, whereas in that of others it must not be—that is, if it is not of the combination [of the matter and the form].<sup>781</sup> For this is why some things [come to be] from those [materials] as starting-points into which they pass away, whereas other things do not.

Things, in fact, that are combinations of the form and the matter, for example, the snub or the brazen circle, are the ones that pass away into these parts, and a part of them is the matter.<sup>782</sup> On the other hand, things with which the matter is not combined, but are without matter, and whose accounts are of the form alone, these do not pass away, either at all or not in *this* way.<sup>783</sup> And so of the combinations these are starting-points and parts, but of the forms they are neither parts nor starting-points.<sup>784</sup> And that is why the statue of clay passes away into clay, the [brazen] sphere into bronze, Callias into flesh and bones, and furthermore the circle into the segments (for there is a sort of circle that is combined with matter). For something is said to be the circle homonymously, [since the term is applied] both to the one said to be such unconditionally and to the particular one, because there is no name special to the particular ones.<sup>785</sup>

The truth has already now been stated, but nonetheless let us take up the topic again and state it yet more perspicuously.<sup>786</sup> For the parts of the account, into which the account is divided, are prior to it—either all or some. The account of the right angle, however, does not divide into the account of the acute angle, rather, that of the acute divides into the right.<sup>787</sup> For the person defining the acute makes use of the right. For the acute angle is one that is less than a right. The circle and the semicircle behave in the same way. For the semicircle is

defined by the circle and so is the finger by the whole, since a finger is such-and-such sort of part of a human. And so those things that are parts as matter, into which a thing divides as into matter, are posterior, whereas those that are parts as parts of the account and of the substance, namely, the one that is in accord with the account, are prior—either all or some.

Now since the soul of animals (for this is substance of the animate) is the substance that is in accord with the account and is the form and the essence of such-and-such sort of body (certainly each part, if it is to be defined correctly, will not be defined without its function, which it could not have without perception), it follows that the parts of this are prior, either all or some, to the compound animal, and similarly, then, to each particular animal, whereas the body and its parts will be posterior, and what is divided into these as into matter is not the substance but the compound.<sup>788</sup> These bodily parts, then, are in a way prior to the compound, but in a way not, since they cannot even exist when they are separated. For it is not a finger in any and every state that is the finger of an animal, rather, a dead finger is only homonymously a finger. Some of these parts, however, are simultaneous, namely, the ones that are controlling and in which the account and the substance are first found—for example, the heart, perhaps, or the brain (for it makes no difference which of them is of this sort).<sup>789</sup>

The human and the horse, though, and things that are in this way set over the particulars, that is, [taken] universally, are not substance but rather a compound of a sort, [consisting] of this account and this matter taken universally.<sup>790</sup> As a particular, though, Socrates is already composed of the ultimate matter, and similarly in the other cases.<sup>791</sup>

A part, then, can be a part either of the form (by form I mean the essence), or of the compound that is composed of the form and the matter itself.<sup>792</sup> But only the parts of the form are parts of the account, and the account is of the universal.<sup>793</sup> For the being for circle and circle and the being for soul and soul are the same.<sup>794</sup> But of what is already a compound such as this circle, that is, one of the particular ones, whether perceptible or intelligible (by intelligible ones I mean, for example, the mathematical ones, by perceptible ones, for example, the brazen or wooden ones)—of these there is no definition, but it is with understanding or perception that they are known, and when they depart from this actuality it is not clear whether they are or are not.<sup>795</sup> But they are always said to be and are always known by means of the universal account. But the matter is intrinsically unknowable.<sup>796</sup> Some matter is perceptible, however, while some is intelligible—perceptible

matter being, for example, bronze, wood, and any matter that is movable, and intelligible matter being the sort that is in the perceptible things but not insofar as they are perceptible, such as the objects of mathematics.<sup>797</sup>

The way things stand concerning whole and part and concerning the prior and posterior has now been stated. And it is necessary to say in response, when someone asks whether it is the right angle, the circle, and the animal that are prior or the things into which they are divided and from which they are composed, that it cannot be answered simply. For if even the soul is animal or animate thing, or the soul of each animate thing is this animate thing, and if the circle is being for the circle, and the right angle is being for the right angle (that is, the substance of the right angle), then some [whole] should be said to be posterior to some [parts], for example, to the parts in the account and to the parts of the particular right angle, since both the one with the matter, the brazen right angle, and the one in particular lines are posterior to these.<sup>798</sup> The right angle without matter, by contrast, is posterior to the parts in the account, but prior to the parts in the particular right angle—unconditionally prior to its parts, however, it should not be said to be. If, on the other hand, the soul is a distinct thing and is not animal, even then some parts must be said to be prior and some must not be said to be prior, as was stated.

## Z 11

A puzzle quite sensibly arises, however, as to what sorts of parts are parts of the form and what sorts are not parts of it but rather of the combination. And yet if this is not clear, it is not possible to define each thing.<sup>799</sup> For the definition is of the universal and of the form. If, then, it is not evident which sorts of parts are parts as matter and which sorts are not, the account of the thing will not be evident either.

In the case of things that evidently come to be in different kinds (*eidos*) [of materials], as circle does in bronze and stone and wood, it seems clear that these, for example, the bronze or the wood, do in no way belong to the substance of the circle, because of it being separate from them. But in the case of things that are not seen being separate, nothing prevents the situation from being similar, just as if all the circles were seen to be of bronze. For nonetheless the bronze would still not belong to the form, but it would be difficult to subtract it in thought.<sup>800</sup> For example, the form of the human is always found in flesh and bones and parts of this sort. Are these, then, also parts of the form and of the account? Or are they not [parts], but rather

matter—but because the form never comes to be in anything else it is impossible to separate it?

Since, however, this does seem to be possible, but unclear when it is so, some people already raise the puzzle even in the case of the circle and the triangle, supposing that it is not proper to define these in terms of lines and the continuous, but that all these too should be said [of things] in the way flesh and blood are of the human or bronze and stone of the statue.<sup>801</sup> And so they lead everything back to numbers, and say that the account of line is that of the two.<sup>802</sup> And of those who accept the Ideas, some say that the dyad is the line-itself, some that it is the Form of the line, since while in some cases the Form and what it is the Form of are the same (for example, the dyad and the Form of the dyad), in the case of the line this is not at all so.

It follows, then, that there is both one Form of many things whose forms are evidently distinct (which is just what followed for the Pythagoreans too), and that it will be possible to make one Form-itself of all things, and make the others not Forms—and yet in this way all things will be one.<sup>803</sup>

It has been stated, then, that there is a puzzle where definitions are concerned, and what its cause is. And that is why to lead all things back to Forms in this way and to subtract the matter is beside the point. For some things presumably are this in this, or these things in this state.<sup>804</sup> And the comparison in the case of animal that Socrates the younger used to make is not correct.<sup>805</sup> For it leads away from the truth and makes us suppose that the human can exist without the parts, as the circle can without the bronze. But the case is not similar. For the animal is presumably something capable of perception, and it is not possible to define it without movement, nor, therefore, without the parts being in a certain state.<sup>806</sup> For a hand in any and every state is not a part of the human, but one that is capable of fulfilling its function, and so is animate, and if not animate is not a part.<sup>807</sup>

Where the objects of mathematics are concerned, though, why are the accounts of the parts not parts of the accounts, as the semicircles are of the circle? For it is not as if *these* are perceptible. Or does this make no difference? For there will be matter even of some things that are not perceptible and of everything that is not an essence.<sup>808</sup> The semicircles, then, will not be parts of the universal circle but will be parts of the particular ones, as was said before.<sup>809</sup> For while there is one sort of matter that is perceptible, there is another that is intelligible.<sup>810</sup>

It is clear too that the soul is primary substance, whereas the body is matter, and the human or the animal is the thing composed of both

taken universally.<sup>811</sup> Socrates (or Coriscus), on the other hand, if the soul is also Socrates, is twofold. For some take him to be a soul, others the compound.<sup>812</sup> But if he is unconditionally this soul here and this body here, then as the universal is, so the particular is too.<sup>813</sup>

Whether there is, beyond the matter of these sorts of substances, another sort of matter, and whether we should look for another sort of substance, such as numbers or something of this sort, must be investigated later.<sup>814</sup> For it is for the sake of this that we are trying to make some determinations about the perceptible substances, since in a certain way it is the function of natural science and secondary philosophy to have theoretical knowledge of perceptible substances.<sup>815</sup> For it is not only about the matter that the natural scientist must know but also about the substance that is in accord with the account—in fact more so.<sup>816</sup>

The way the things in the account are parts in the case of the definitions, and why the definition is an account that is *one* (for it is clear that the thing is one, but one *in virtue of what*, given that it certainly has parts?), must also be investigated later.<sup>817</sup>

What the essence is, then, and what way it is intrinsically, has now been stated universally where every case is concerned, and also why the account of the essence of some things contains the parts of the definiendum, but that of other things does not.<sup>818</sup> And we have stated that in the account of the substance the parts as matter will not be present—for they are not even parts of that substance, but of the compound one, and of this there is in a way an account and in a way not. For of the compound with the matter there is not an account (for it is indefinite), but with respect to the primary substance there is—for example, of human, the account of the soul.<sup>819</sup> For the substance is the form present in the thing, from which together with the matter the compound substance is said to be composed—for example, the concavity. For from this and the nose both snub nose and the snubness are composed (indeed in these the nose will be present twice).<sup>820</sup> But in the compound substance—for example, in snub nose or in Callias—there will be matter present as well.

It has also been stated that the essence [of a thing] and the thing [itself] are in some cases the same—for example, in the case of the primary substances.<sup>821</sup> By a primary substance I mean what is not said to be by being one thing in another, that is, in an underlying subject as matter.<sup>822</sup> But things that are [said to be] as matter or as combinations with matter are not the same [as their essence], nor are those that are one coincidentally, such as Socrates and the musical (for these are coincidentally the same).<sup>823</sup>

## Z 12

Let us now, however, first speak—to the extent that we have not already discussed it in the *Analytics*—about definition.<sup>824</sup> For the puzzle that was stated there advances the work of our arguments about substance.<sup>825</sup> I mean this puzzle: why on earth is something one when the account of it is what we call a definition?<sup>826</sup> For example, let the account of the human be the two-footed animal. Why, then, is this one and not instead many—animal *and* two-footed? For in the case of human and pale they are many when one does not belong to the other, but they are one when it does belong and the underlying subject, the human, has a certain attribute (for, then, one thing comes to be and we have the pale human).

In the present case, by contrast, one does not participate in the other.<sup>827</sup> For the genus does not seem to participate in the differentiae (in fact if it did the same thing would participate in contraries at the same time, since the differentiae that divide the genus are contraries).<sup>828</sup> But even if it did participate, the argument would be the same, if indeed the differentiae are many—for example, footed, two-footed, featherless. Why are these one and not instead many? For it is not because these are present [in one genus], since that way there will be one from all.<sup>829</sup> But surely the things in the definition must be one. For the definition is a certain account that is one and of substance, so that it must be the account of one something. For the substance signifies one something and a this something, as we say.<sup>830</sup>

We should first investigate definitions that are by division.<sup>831</sup> For there is nothing else in the definition except the genus that is mentioned first and the differentiae; the other genera are in fact the first one along with the differentiae combined with it. The first, for example, may be animal, the next two-footed animal, and next again featherless two-footed animal, and similarly if it is said by means of more differentiae.<sup>832</sup> And in general it makes no difference whether it is said by means of many or of few—nor, therefore, whether by means of few or by means of just two. And of the two one is differentia and the other genus—for example, in the two-footed animal, the animal is genus and the other differentia.

If, then, the genus is unconditionally nothing beyond the species as species of a genus, or if it is, it is as matter (for the voiced sound is genus and matter, and the differentiae produce the phonetic elements from this), then it is evident that the definition is the account composed of the differentiae.<sup>833</sup>

But in addition the division should take the *differentia of the differentia*—for example, the footed is a differentia of animal, and next again we should know the differentia of the footed animal insofar as it is footed. So we should not say that of the footed there is on the one hand the feathered and on the other the featherless, if indeed we are to speak correctly (on the contrary, it is through lack of ability that we will say this), but rather that there is on the one hand the cloven-footed and on the other the not cloven-footed.<sup>834</sup> For these are differentiae of foot. For the cloven-footed is a sort of footed. And we should try to proceed always in this way until we reach the undifferentiated [species]. At that point there will be precisely as many species of foot as there are differentiae, and the footed animals will be equal in number to the differentiae.<sup>835</sup>

If, then, this is how things stand, it is evident that the ultimate differentia will be the substance of the thing and its definition, if indeed we should not state the same thing many times in the definitions, since that would be wasted work.<sup>836</sup> And this is certainly what does happen. For when we say two-footed footed animal we have said nothing other than animal with feet with two feet. And if we divide this too by a proper division, we shall be saying the same thing several times over—as many times as there are differentiae. If, then, we take a differentia of a differentia, one differentia—the ultimate one—will be the form and the substance. But if we divide coincidentally—for example, if the footed were divided into the pale and the dark—there will be as many differentiae as there are cuts.<sup>837</sup>

Thus it is evident that the definition is the account composed of the differentiae, or, if it is in accord with the correct procedure, the ultimate one. This would be clear if we were to change the order in such definitions—for example, in that of the human, saying footed two-footed animal. For it is wasted work to say footed when two-footed has been said.<sup>838</sup> And there is no order in the substance, since how could we understand one thing as being prior and another posterior?<sup>839</sup>

Where definitions by division are concerned, then, let this much suffice as a first statement as to what they are like.

## Z 13

Since, however, it is with substance that the investigation is concerned, we should return to that. Just as the underlying subject and the essence are said to be substance, so also is the universal.<sup>840</sup> Now, about two of these we have already spoken, namely, about the essence and the underlying subject, and said that it underlies in two ways,

5 either by being a this something (as the animal underlies its attributes) or as the matter underlies the actuality.<sup>841</sup> But the universal too seems to some people to be most of all a cause, and the universal most of all a starting-point.<sup>842</sup> So let us turn to that too. For it seems impossible for any of the things said [of something] universally to be substance.

10 For first the substance of each thing is special to it, in that it does not belong to anything else.<sup>843</sup> A universal, by contrast, is something common, since that thing is said to be a universal which naturally belongs to many things.<sup>844</sup> Of which, then, will it be the substance? For it is either the substance of none or of all. And it cannot be the substance of all. But if it is the substance of one, all the others will be this one as well. For things whose substance is one and whose essence is one are also themselves one.

15 Further, substance is said to be what is not said of an underlying subject, whereas a universal is always said of a certain underlying subject.

20 But perhaps the universal, while it cannot be substance in the way in which the essence is, can yet be present in it—for example, as the animal is present in the human and the horse. Well then, clearly there is some account of it.<sup>845</sup> And it makes no difference even if it is not the account of everything in the substance. For this [universal] will not be any the less the substance of something, as the human is of the human in whom it is present. And so the same result will again follow, since it (for example, the animal) will be the substance of that in which it is present as something special to it.<sup>846</sup>

25 Further, it is both impossible and absurd for the this (that is, the substance)—if it is composed of something—not to be composed of substances or of the this something but of a quality. For then non-substance (that is, the quality) will be prior to substance (that is, to the this). Which is just what is impossible. For neither in account nor in time nor in knowledge can the attributes be prior to the substance.<sup>847</sup> For then they will also be separable.

Further, in Socrates substance will be present, and so it [the universal] will be the substance of two things.<sup>848</sup>

30 And in general it follows—if the human and whatever is said of things in that way are substance—that none of the things in their account is substance of any of them or is separate from them or in something else. I mean, for example, that there is not some animal—or any other of the things in the account—beyond the particular ones.<sup>849</sup>

If we get our theoretical grasp on the issue on the basis of these considerations, then, it is evident that nothing that belongs universally



to things is substance, and that none of the things that are predicated in common signifies a this something but a such-and-such sort. If not, many other difficulties result, and especially the *Third Man*.<sup>850</sup>

Further, the issue can also be made clear in this way. For it is impossible for a substance to be composed of substances that are actually present in it.<sup>851</sup> For things that are actually two in this way are never actually one, although if they are potentially two, they can be one. For example, the double line is composed of two half-lines, at any rate potentially. For their actuality separates them. And so if the substance is one, it will not be composed of substances present in it and present in the way that Democritus rightly states.<sup>852</sup> For he says that it is impossible for one to be composed of two or two of one. For he makes the indivisible magnitudes the substances. It is clear therefore that the same will hold in the case of number, if indeed number is composed of units, as some people say. For two is either not a one, or there is no unit actually present in it.<sup>853</sup>

But this result involves a puzzle. For if no substance whatsoever can be composed of universals because they signify the such-and-such sort but not this something, and if also no substance can be actually composed of substances, then every substance would be incomposite, so that there could not even be an account of any substance whatsoever. But then it *seems* to everyone, and was stated long ago, that definition is either of substance only or of it most of all, whereas now it seems not even to be of it.<sup>854</sup> So there will not be a definition of anything at all. Or else in one way there will be one, but in another way there will not. What is being said will be more clear on the basis of what comes later.<sup>855</sup>

## Z 14

But it is also evident from these very considerations what the consequence is for those who say that the Ideas are substances and separable, and at the same time make the Form be composed of the genus and the differentiae.<sup>856</sup> For if there are the Forms, and if the animal is present in the human and the horse, it is either [1] numerically one and the same in each, or else [2] numerically distinct. For in account it is clear that it is one, since the person giving the account will go through the same account in either case. If, then, there is some human-itself that is intrinsically a this something and separated, it is also necessary for the things from which it is composed—for example, the animal and the two-footed—to signify a this something and to be both separable and substances. And so the animal too will be like this.

Now if [1] the animal that is both in the horse and in the human is one and the same, just as you are one and the same as yourself, [1a] how will what is present in separate things be one, and why will this animal too not be separate from itself?<sup>857</sup> Next, [1b] if it is to participate in the two-footed and the many-footed, something impossible follows, since contraries will belong to it at the same time, although it is one and a this something. But if it is not to participate in them, what way are they related when we say that the animal is two-footed or footed? Are they perhaps *combined* and *making contact* or *mixed together*? Yet all of these are absurd.<sup>858</sup>

On the other hand, [2] suppose the animal is a distinct thing in each, then there will be (one might almost say) an unlimited number of things whose substance is animal, since it is not coincidentally that the human is composed of animal.<sup>859</sup> Further, the animal-itself will be many things. For [2a] the animal in each will be substance, since it is not with reference to anything else that it is said to be. But if it were, the human will be composed of that other thing, and its genus will be that. And further [2b] all the things from which the human is composed will be Ideas. But nothing will be the Idea of one thing and the substance of another, since that is impossible.<sup>860</sup> Hence each of the animals present in the various [species] of animals will be animal-itself.<sup>861</sup> Further, from what is this latter one composed—that is, how is it composed of animal-itself? Or how can this animal, whose substance is this itself, be beyond *the* animal-itself?<sup>862</sup>

Further, in the case of the perceptibles, these and even more absurd results follow. If, then, it is impossible for things to hold in this way, it is clear that there cannot be Forms of these in the way that some people say.

## Z 15

Since substance is in distinct ways, both as the compound and as the account (I mean that the first is substance in this way, the account combined with the matter, whereas the other is wholly the account), it follows that of those said to be such in the first way there is passing away (for there is coming to be as well), but there is none—in the sense of being in the process of passing away—of the account, since there is no coming to be either (for the being for house does not come to be, but the being for *this* house), rather, without coming to be or passing away, they are or are not.<sup>863</sup> For it has been shown that no one begets or makes these.<sup>864</sup>

This is also why there is neither definition nor demonstration of the substances that are perceptible and particular, [namely,] because

they have matter whose nature is such that it is capable of both being and not being (which is why all the particular ones of them can pass away).<sup>865</sup> At all events, if demonstration is of necessary things and definition is a matter of scientific knowledge, and if, just as scientific knowledge cannot be scientific knowledge at one time and ignorance at another (but instead it is belief that is like that), so neither definition nor demonstration can be that way either (but instead it is belief that is of what admits of being otherwise), then it is clear that there will not be either definition or demonstration of such things.<sup>866</sup> For things that pass away are unclear to those who have scientific knowledge when they have departed from perception, and, though the accounts are preserved the same in their soul, there will still not be either definition or demonstration.<sup>867</sup> That is why, in issues relating to definition, when someone is defining one of the particular things, we must not be ignorant of the fact that it is always possible to do away with this definition, since particulars cannot be defined.<sup>868</sup>

Nor indeed can any Idea be defined.<sup>869</sup> For the Idea is a particular, so they say, and separable.<sup>870</sup> But its account must be composed of names, and the definer cannot make up a name (since it would be an unknown). Yet each of the established names is common to all. Hence they must belong to something else as well. For example, if someone were defining you, he would say that you are an animal that is thin or pale or something else that will also belong to something other than you. And if someone were to say that nothing prevents all these taken separately from belonging to many things, but that taken all at once they belong only to this one, we should reply:<sup>871</sup> First, they also belong to both components—for example, the two-footed animal belongs to the animal and to the two-footed.<sup>872</sup> In fact, in the case of the eternal things this is even necessary, because the components are prior to and parts of the composite. More than that, they are also separable, if indeed the human is separable. For either neither is separable or both are. But if neither is, the genus will not exist beyond the species, and if it does, so will the differentiae. Second, they [the animal, the two-footed] are prior in being [to the two-footed animal]. But things that are prior to others are not done away with together with them. Again, if the Ideas are composed of Ideas (for the things they are composed of are less composite), it will furthermore be necessary that the things from which the Idea is composed—for example, the animal and the two-footed—be predicated of many things. If not, how will they come to be known? For there will then be an Idea that cannot be predicated of more than one

thing. That does not seem to be the case, though. On the contrary, every Idea seems to admit of being participated in.

As has been said, then, the impossibility of defining [particulars] escapes notice in the case of eternal things, especially those that are unique—for example, the sun and the moon.<sup>873</sup> For people err by adding the sort of things whose removal would leave it still being the sun, such as “going around the earth” or “being hidden at night.”<sup>874</sup> For [this would entail] that if it stood still or was visible at night, it would no longer be the sun. But if it were not, that would be absurd. For the sun signifies a certain substance. Further, [they err not only in that way but also by mentioning] things that can belong to something else—for example, such that if a second thing of the relevant sort comes to be, it is clear that it will be a sun—with the result that the account is common to both. But the sun was supposed to be a particular, just like Cleon or Socrates.

After all, why is it that none of these [who believe in] Ideas put forth a definition of them? For it would become clear, if they tried, that what has just been said is true.

## Z 16

It is evident that even of the things that seem to be substances, most are capacities, whether the parts of animals (for none of them exists when it has been separated, and whenever they are separated they all exist only as matter) or earth, fire, and air (for none of them is one, but instead they are like a heap, until they are concocted and some one thing comes to be from them).<sup>875</sup>

We might most readily suppose, however, that the parts of animate things, and the parts of the soul close to them, turn out to exist in both ways, namely, both actually and potentially, due to having starting-points of movement deriving from something in their joints—which is why some animals go on living when divided.<sup>876</sup> All the same, when they are one and continuous by nature, rather than by force or by growing together, these will all exist potentially.<sup>877</sup> For the latter sort of thing is a disability.<sup>878</sup>

But since something is said in the same ways to be one and to be, and the substance of what is one is one, and things whose substance is one in number are one in number, it is evident that neither one nor being can be the substance of things, just as neither being for an element nor being for a starting-point can.<sup>879</sup> Rather, we look for what the starting-point of something is in order to lead the thing back to something more knowable. So then, of these, being and one are in fact substance to a higher degree than are starting-point or element or cause.<sup>880</sup>

But not even they are substance, if indeed nothing else—nothing that is common—is either. For the substance belongs to nothing but itself and what has it, of which it is the substance.<sup>881</sup> Further, what is one cannot be in many places at the same time, but what is common does belong in many places at once. And so it is clear that no universal exists separately, beyond the particulars.<sup>882</sup>

On the other hand, those who accept the Forms speak correctly in one way, namely, in separating them (if indeed the Forms are substances), but in another way not correctly, because they say that the one over many is a Form. And the cause of this is that they do not have [an account] to give of the substances that are of this sort—the imperishable ones that are beyond the particular perceptible ones. So they make them the same in kind (*eidos*) as perishable things (for these are the ones we do know), man-itself and horse-itself, adding to the perceptible ones the word “itself.”<sup>883</sup> Yet even if we had never seen the stars they would nonetheless, I take it, have been eternal substances beyond the ones we knew, so that even as things stand, if we do not grasp which ones they are, it is at any rate presumably just as necessary that there be some.

It is clear, then, that nothing said of things universally is substance, and that no substance is composed of substances.<sup>884</sup>

## Z 17

Let us make, as it were, a fresh start and say again what, and what sort of thing, substance should be said to be.<sup>885</sup> For perhaps from this we may also make clear that substance, whatever it is, that is separated from the perceptible substances. Since, then, the substance is some sort of starting-point and cause, let us pursue it from there.<sup>886</sup>

The why is always inquired into in this way: why does one thing belong to a certain other? For to inquire into why the musical human is a musical human is either, as we just said, to inquire into why the human is musical, or [why it is the] other. But to inquire into why a thing is itself is to inquire into nothing. For that something is the case and that it exists—*that* should [already] be clear.<sup>887</sup> I mean, for example, that the moon is eclipsed. But that a thing is itself—of that there is one account and one cause in all cases, [as in] why the human is human or the musical is musical. Unless someone were to say that it is because each thing is indivisible from itself, and this is what it is for it to be one. But that at any rate is common to all cases and too concise.<sup>888</sup> We *can*, though, inquire into why the human is an animal

of such-and-such sort. It is clear, accordingly, that this is not to inquire into why that thing, which is a human, is a human.

It is when something is [predicated] of something, then, that we inquire into why it belongs to that thing (but that it does belong must be clear, since if things are not that way, there is nothing to inquire into). For example: Why does it thunder? is Why is there noise in the clouds? For this way what we are inquiring into is one thing [predicated] of another. And why are these—for example, brick and stones—a house? It is evident, accordingly, that we are inquiring into the cause. This is the essence, logico-linguistically (one might almost say). But in some cases it is what the thing is for the sake of (for example, it is presumably this in the case of a house or a bed), and in some it is what first initiated the movement, since this is also a cause. But the latter is inquired into in cases of something's coming to be and passing away, whereas the former is inquired into also in the case of a thing's being.

What we are inquiring into most easily escapes notice, however, in cases where one thing is not said of another. For example, human, when we are inquiring into what it is, it escapes notice, because it is said simply, and we do not distinguish that these things are this. But we must divide up before inquiring. Otherwise, inquiring into nothing and inquiring into something will become joint inquiries. But since the existence [of the subject] and also the belonging [of the predicate to it] must be the case, it is clear, accordingly, that what we are inquiring into is why the matter is something. For example, why are these things a house? Because the being for house belongs to them. Why is this—or rather this body in this state—a human?<sup>889</sup> So what is being looked for is the cause in virtue of which the matter is something—and this is the substance. It is evident, accordingly, that in the case of things [said] simply there is neither inquiry nor teaching, but instead another way than inquiry belongs to them.<sup>890</sup>

Since what is composed of something in such a way that the totality is one, not like a heap but like a syllable—

The syllable is not its phonetic elements, BA is not the same as B and A, nor is flesh fire and earth. For when they—for example, the flesh and the syllable—are dissolved they no longer exist, whereas the phonetic elements do exist, and so do the fire and the earth. The syllable, then, is something—not its phonetic elements alone, the sounded [= A] and the unsounded [= B], but also something else, and the flesh is not only fire and earth or the hot and the cold but also something else.

—If, therefore, that something else must be either [1] an element or [2] composed of elements, then [1] if it is an element the same argument will apply again, since the flesh will be composed of this and fire and earth, and something else again, so that the process will go on without limit.<sup>891</sup> If, on the other hand, [2] it is composed of an element, it is clear that it must be not only from one but from more than one, or else that one will be the thing itself, so that again in this case we can state the same argument as in the case of the flesh and syllable. But it would seem to be *something*, and not an element, and a cause in fact of this being flesh and this being a syllable. And similarly in the other cases.

This, however, is the substance of each thing, since it is the primary cause of their being. But since some things are not substances, rather, those things are substances that are composed in accord with nature and by nature, this nature would seem to be their substance, and it is not an element but a starting-point.<sup>892</sup> An element, by contrast, is what a thing can be divided into and which is present in it as matter—like the A and the B of the syllable.

## BOOK ETA (VIII)

### H 1

Based on what has been said, then, we must deduce conclusions and, drawing together the main points, put a finish to our inquiry.

[1] We said, then, that our inquiry is into the causes, the starting-points, and the elements of substances. [2] And, as to substances, some are agreed upon by all, whereas others have been advocated by certain people on their own behalf. The agreed upon ones are the natural ones—for example, fire, earth, water, air, and the other simple bodies, then plants and their parts, the animals and the parts of the animals, and finally the heaven and the parts of the heaven.<sup>893</sup> And some people say on their own behalf that the Forms and the objects of mathematics are substances. And in another way, in fact, it then follows on the basis of the arguments that [3] the essence and [4] the underlying subject are substances. And in yet another way it follows [5] that the genus is more substance than the various species, and [6] the universal more so than the particulars.<sup>894</sup> [7] And with the universal and the genus the Ideas are closely connected, since it is with reference to the same argument that they seem to be substances.<sup>895</sup> [8] And since the essence is substance, and a definition is an account of the essence, that is why definition and what is intrinsic were discussed. [9] And since the definition is an account, and the account has parts, it was also necessary to see where a part is concerned what sorts are parts of the substance and what sorts are not, and whether these are parts of the definition as well. [10] Further, too, neither the universal nor the genus is substance. [11] And as for the Ideas and the objects of mathematics, they should be investigated later, since some say that these are substances that are beyond the perceptible ones.<sup>896</sup>

Now, however, we should go through the agreed upon substances. These are the perceptible ones. And the perceptible substances all have matter. Now the underlying subject is substance, and in one way this is the matter (by the matter I mean what though not actively a this something is potentially a this something); in another way, it is the account and the shape, which being a this something is separable in account; and in a third way, what is composed of them, of which alone there is coming to be and passing away, and which is unconditionally separable.<sup>897</sup> For of substances that are in accord with the account some are separable and some are not.<sup>898</sup>



It is clear, though, that matter too is substance. For in all changes from one opposite to another there is something that underlies the changes. For example, in change in place, there is what is now here and later on there; in change in growth, there is what is now one size and later on larger or smaller; in change involving alteration, there is what is now healthy and then again sick; and similarly in change in substance, there is what is now coming into being and later passing away, and now is underlying subject as a this something and then again as being so as a lack. The other sorts of changes follow along, then, with this sort, but this one does not follow along with either one or both of the others. For if a thing has matter for change of place, it is not necessary that it also have it for coming to be and passing away.<sup>999</sup> (What the difference is between unconditional coming to be and coming to be that is not unconditional has been stated in our works on nature.<sup>900</sup>)

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1042<sup>b</sup>1

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## H 2

Since substance as underlying subject and as matter is generally agreed upon, and this is the one that is potentially, it remains to say what substance—as *activation*—of the perceptibles is.<sup>901</sup>

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Now Democritus for his part seems to think that there are three differentiae.<sup>902</sup> For he thinks that the underlying body and the matter are one and the same, but it is differentiated either by rhythm (that is, shape), or by turning (that is, position), or by contact (that is, order). It is evident, however, that there are many differentiae. Some things are said to be, for example, due to the mode of combination of their matter, like those said to be due to blending (such as honey-water), or due to tying (such as a bundle), or due to gluing (such as a book), or due to nailing (such as a box), others due to more than one of these. Others are said to be due to position—for example, a threshold or a lintel (for these differ due to how they are placed); others due to time (such as dinner and breakfast); others due to place (such as the winds); and others due to the attributes [special] to perceptibles (such as hardness and softness, density and rarity, dryness and wetness), some due to some of these, others due to all—and in general some due to excess, some to deficiency.<sup>903</sup>

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So it is clear that something is said to be in that many ways too. For a threshold *is* because it is placed thusly, and the being for a threshold signifies its being placed thusly, and the being for ice signifies its being solidified thusly. And in some cases their being will even be defined by all of these, due to some parts being mixed, some blended, some bound, some solidified, and some making use of the other differentiae, as do hand and foot.<sup>904</sup>

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We must, then, get hold of the kinds (*genos*) of the differentiae—for these are going to be starting-points of the being.<sup>906</sup> For example, the ones differentiated by the more and less, or by dense and rare, or by others of this sort. For all these are [kinds of] excess and deficiency. And if something is differentiated by shape, or by smoothness and roughness, all these are differentiated by [kinds of] straight and curved.<sup>906</sup> And for other things being is being mixed and not being is the opposite.<sup>907</sup> From these cases, then, it is evident—if indeed its substance is the cause of each one's being—that it is in these differentiae that we must look for what the cause is of the being of each of them.<sup>908</sup>

Now none of these differentiae is substance, not even when it is coupled [with matter], nonetheless in each case it is the analogous thing to it.<sup>909</sup> And just as in substances what is predicated of the matter is the activation itself, so in the other definitions too it is what is most of all this.<sup>910</sup> For example, if we had to define a threshold, we would say wood or stone placed this way; and a house, bricks and timbers placed this way (or, again, in some cases the for-the-sake-of-which is included too); and if ice, water frozen or solidified this way; and harmony, high and low mixed such-and-such a way. And the same way in the other cases. It is evident, then, from these things that the activation of one matter is different from that of another, and so is the account.<sup>911</sup> For of some things, it is the mode of combination, of others the mixing, and of others some other of the things we mentioned. That is why of [1] those who give definitions, the ones who in saying what a house is say that it is stone, bricks, and timbers are speaking of what is potentially a house, since these are matter. [2] Those, on the other hand, who propose that it is a receptacle to shelter property and bodies, or something else of that sort, are speaking of the activation.<sup>912</sup> But [3] those who combine both of these speak of the third sort of substance, the one composed of them.<sup>913</sup> For it seems that [2] the account that it is given in terms of the differentiae is of the form and the activation, while [1] the one that is composed of the constituents is an account of the matter instead.<sup>914</sup> And similarly for the sorts of definitions that Archytas used to accept, since [3] they are of both combined.<sup>915</sup> For example, what is stillness? Quietness in a large quantity of air. The air is matter; the quietness is activation and substance. What is a calm? Smoothness of sea. The underlying subject as matter is the sea; the activation and the shape is the smoothness.

It is evident, then, from what has been said, what perceptible substance is, and the way it is. For there is the one as matter, the one as shape and activation, and the one composed of these.

## H 3

But we should not be ignorant of the fact that sometimes it escapes notice whether the name signifies the composite substance or the activation and the shape—for example, whether “house” is a sign for the joint thing, because it is a covering composed of bricks and stones placed this way, or for the activation and the form, because it is a covering, or whether a line is a two in length or a two, or whether an animal is a soul in a body or a soul (for a soul is substance and activation of a certain sort of body).<sup>916</sup> “Animal” might in fact be applied to both, not as something said in one account but rather with reference to one thing.<sup>917</sup> But though this makes a difference in relation to another issue, in relation to our inquiry into the perceptible substance it makes none, since the essence belongs to the form and the activation. For a soul and being for a soul are the same, but being for a human and a human are not the same, unless the soul too is also going to be said to be a human—in which case, in one way they are the same, in another way not.<sup>918</sup>

It is evident, then, to those who investigate it that the syllable is not composed of the phonetic elements plus a mode of combination, nor is the house bricks plus a mode of combination as well. And this is correct. For neither the mode of combination nor the mixing is composed of the things of which it is a combination or a mixing. And similarly in the other cases. For example, if the threshold is due to position, the position is not composed of the threshold, but rather the latter of the former. Nor indeed is the human the animal plus two-footed, but there must be something else beyond these, if these are matter—something that is neither an element nor composed of elements, but is rather the substance. And it is once people do away with this that they state only the matter. If, then, this is cause of the being, and if this is substance, they will not be stating the substance itself.<sup>919</sup>

(This substance, then, must either be eternal or it must be capable of passing away without being in the process of passing away, and must have come to be without [ever] being in the process of coming to be.<sup>920</sup> For it has been shown and made clear in another discussion that no one makes or begets the form, but instead it is a this that is made, and the thing composed of [matter and form that] comes to be.<sup>921</sup>

As to whether the substances of things that can pass away are separable, though, nothing is yet clear—except that it is clear that it is impossible in *some* cases, namely, those where it is impossible for them to be beyond the particular instances, like a house or a tool. Perhaps indeed neither these nor any of the other things that are not composed

by nature are substances at all.<sup>922</sup> For one might take the nature to be the only substance found in things that can pass away.<sup>923</sup>)

So the puzzle that the followers of Antisthenes and similarly uneducated people used to puzzle over has a certain timeliness, namely, that it is impossible to define the what-it-is (for a definition is a "long story"), although it is actually possible to teach people what sort of thing it is.<sup>924</sup> For example, silver—what it is we cannot say, but that it is like tin, we can say.<sup>925</sup> So of one sort of substance there can be a definition and an account, namely, of the compound sort, whether perceptible or intelligible, but of the primary parts of which this is composed, there cannot be any, if indeed the definitional account signifies something [predicated] of something, and one must play the part of matter and the other of shape.<sup>926</sup>

It is also evident why, if indeed substances are in a way numbers, they are so in this way and not, as some people say, as numbers of units. For a definition is a sort of number, since it is divisible, and indeed into indivisibles (for the accounts are not unlimited), and number is like that. And just as when one of the parts of which a number is composed is subtracted from or added to the number, it is no longer the same number but a different one, even if it is the very smallest part that has been subtracted or added, so too neither the definition nor the essence will any longer be the same if anything is subtracted or added. And in fact the number must be what makes something one, though they cannot now say what makes *it* one, if indeed it is one. For either it is not one but rather a sort of heap, or if indeed it is one, they should say what it is that makes it one from many. The definition is one as well, but similarly they cannot say what makes it one either. And this result makes perfect sense, since the argument is the same [in both cases].

The substance is also one in this way, and not—as some say—by being a sort of unit or point, but rather each is an actuality and a sort of nature.<sup>927</sup> And just as the number does not admit of more and less neither does the substance that is in accord with the form, but if indeed any does it is the one with the matter.<sup>928</sup>

Concerning the coming to be and passing away of what are said to be substances, then, and in what way it is possible and in what way not, and concerning the leading back of things to numbers, let this much be determined.

#### H 4

Where material substance is concerned we must not neglect to consider that even if all things come from the same primary thing or from

the same things as primary, and even if the same matter serves as starting-point for the things that come to be, nonetheless there is a sort that properly belongs to each—for example, to phlegm, it is the sweets and the fats, to bile, it is the bitter or some other things. But perhaps these come from the same thing. And there come to be several matters for the same thing when the one is matter for the other—for example, phlegm comes from the fat and the sweet if the fat comes from the sweet. But it comes from bile by the analysis of the bile into its primary matter.<sup>929</sup> For one thing can come from another in two ways, either because it will be found further down the road or because it will be found if the other is analyzed into its starting-point.<sup>930</sup>

It is possible, though, for things, though their matter is the same, to come to be different because of the moving cause—for example, both a box and a bed can be made of wood. But of some things, because they are different, the matter is of necessity different—for example, a saw could not come to be of wood, nor can the moving cause bring this about.<sup>931</sup> For it could not make a saw of wool or wood. Accordingly, if the same thing can be made of different matter, it is clear that the craft—that is, the starting-point, the moving cause—must be the same. For if both the matter and the mover are different, so is the thing that comes to be.

When someone is inquiring into the cause, then, he should—since things are said to be causes in many ways—state all the possible causes. For example, of a human, what is the cause as matter? The menses? What is it as mover? The seed? What is it as the form? The essence. What is it as the for-the-sake-of-which? The end. Perhaps, though, these last two are the same.<sup>932</sup> But it is the closest causes that should be stated. What is the matter? Not fire or earth but the one that is special to the thing in question.

Where substances that are natural and that come to be are concerned, then, it is necessary to proceed in this way if we are to proceed correctly—if indeed the causes are these and this many, and it is the causes that we need to know.<sup>933</sup> But in the case of the natural but *eternal* substances another account is needed. For perhaps some have no matter, or not matter of this sort but only matter capable of movement with respect to place.<sup>934</sup> Nor is there matter for those things that are indeed by nature but are not substances, where instead the substance is the underlying subject.<sup>935</sup> For example, what is the cause of an eclipse? What is its matter? In fact, there is none. Instead, the moon is what suffers [the eclipse]. And what is the cause as moving and extinguishing the light? The earth. As for the for-the-sake-of-which, perhaps there is not one.<sup>936</sup> And the cause as form is the

account. But this is unclear unless it involves the [moving] cause. For example, what is an eclipse? Lack of light. But if we add "as a result of the earth coming in between," then this is the account that involves the cause.<sup>937</sup>

15 In the case of sleep, however, it is not clear what the primary thing is that is affected. Is it the animal? Yes, but the animal with respect to what, and to what primary thing? The heart or something else. Then, as a result of what? Then, what is the affection (that of the primary thing, not of the whole)? Such-and-such sort of immobility? Yes, but to what  
20 affection of the primary thing is this due?<sup>938</sup>

## H 5

Since some things are and are not without coming to be or passing away—for example, points, if indeed they *are*, and in general the forms, since it is not the pale that comes to be but the wood that comes to be pale (if everything that comes to be comes to be from something and comes to be something)—not all contraries could  
25 come to be from each other, but rather a pale human comes from a dark human, and pale from dark, in different ways.<sup>939</sup> Nor does everything have matter, but only those things that come to be and change into one another. But those that are or are not without such changing have no matter.

There is a puzzle, though, about how the matter of a given thing is related to its contrary states. For example, if the body is potentially healthy, and disease is contrary to health, is the body both potentially  
30 healthy and potentially diseased? And is the water potentially wine and potentially vinegar? Or is it rather the matter of one in virtue of its state and its form, and of the other in virtue of the lack of its state and a passing away of it contrary to nature?<sup>940</sup>

There is also a certain puzzle as to why the wine is neither matter of the vinegar nor potentially vinegar, even though vinegar comes to be  
35 from it, and why the living being is not potentially a corpse. Or is it not rather that these passings away are coincidental? And it is the matter of the live animal that is, in virtue of its passing away, itself a potential corpse and matter of a corpse, and the water of vinegar. For they come to be from these [the animal, the wine] just as night does from day. And things that change into one another in this way, then, must revert to their matter. For example, if a live animal were to come to be from a corpse, the corpse would have to first revert to its matter, and then  
1045<sup>b</sup> in this way become an animal, and the vinegar would have to revert to water and then in this way become wine.

## H 6

Let us now consider the puzzle stated earlier about definitions and about numbers, namely, what is the cause of their being one? For of all things that have several parts and where the totality of them is not like a heap, but the whole is something beyond the parts, there is some cause of it, since even among bodies, in some cases contact is the cause of their being one, in others stickiness, or some other attribute of this sort. A definition, however, is an account that is one not by being bound together, like the *Iliad*, but by being of one thing. What is it, then, that makes the human one, and why one and not many—for example, both the animal plus the two-footed? Especially, of course, if, as some people say, there is some animal-itself and some two-footed itself? For why are those things-themselves not the human (so that humans would be [what they are] by participation not in human, nor in one thing, but in two, animal and two-footed, and, in general, then, the human would be not one but more than one, namely, animal and two-footed)?

It is evident, then, that if people proceed in this way—as they usually do—to define and speak, it is not possible to give an answer and solve the puzzle.<sup>941</sup> But if, as we say, there is on the one hand matter and on the other shape, and the one is potentially and the other actively, then what we are inquiring into will no longer seem to be a puzzle. For this puzzle is the same as would arise if the definition of cloak were round bronze. For then this name would be a sign of the account, so that the topic of inquiry is, what is the cause of the round and the bronze being one? There no longer appears to be a puzzle, obviously, because the one is matter, the other shape. So what is the cause of this—of what is potentially being so actually—beyond what produces it (in the case of things where there is a process of coming to be)? For there is no other cause of what is potentially a sphere being actively a sphere; rather, this was the essence for both of them.

Of matter, though, there is some that is intelligible and some that is perceptible, and one part of the account is always the matter and the other the activation—for example, the circle is shape plus plane.<sup>942</sup> On the other hand, each thing that has no matter, whether intelligible or perceptible, is straightaway just what is a one, just as it is also straightaway just what is a being—a this, a quality, a quantity.<sup>943</sup> That is also why neither being nor one (*to hen*) is present in their definitions. Also, the essence is straightaway a one, just as it is straightaway a being. And that is why there is no other thing that is the cause in the case of any of these things either of their being one or of their being. For each of

5 them is straightaway a being and a one, and not because they are in the genus being and the genus one, nor as separable beings beyond the particulars.

It is because of this very puzzle, however, that some people speak of participation and puzzle over what the cause of participation is and what it is to participate. Others, however, speak of communion, as  
 10 Lycophron says that scientific knowledge is a communion between scientifically knowing and soul, whereas others say that living is a combination or bond of union of soul with body.<sup>944</sup> And yet the same account applies to all cases. For something's being healthy will also be either a communion or a bond of union or a combination of soul and health, and the bronze's being a triangle will be a combination of bronze and  
 15 triangle, and something's being pale will be a combination of surface and paleness.<sup>945</sup> The cause of this is that they look for an account of potentialities and actualities that makes them one, *and* for a difference between them.

But in fact, as has been said, the ultimate matter and the shape are one and the same, the one potentially, the other actively, so that it is the same to look for what is the cause of oneness or what is the cause of being one.<sup>946</sup> For each thing is a one, and what potentially is and what  
 20 actively is are in a way one. And so there is no other cause here, unless there is something that brought about the movement from potentiality to activity. Things that have no matter, though, are all unconditionally just what is a one.



## Θ 1

Primary being, that to which all other categories of being are referred back, has been discussed—namely, substance. For it is in accord with the account of the substance that the others are said to be—that is, quality, quantity, and the others that are said to be in this way. For they will all include the account of the substance, as we said in the earlier discussions.<sup>947</sup> But since something is said to be, on the one hand, by being a what or a quality or a quantity, and, on the other hand, with respect to potentiality and actuality and in accord with the function, let us also make some determinations about potentiality and actuality—and first off about what is said to be a potentiality in the fullest sense, even though it is not the most useful for what we wish to investigate now.<sup>948</sup> For potentiality and activity extend more widely than those cases that are said to be such only with reference to movement.<sup>949</sup> When we have spoken about it, though, in the determinations we make concerning activity we shall also make clear the others.<sup>950</sup>

Now, we determined in another discussion that something is said to be a capacity and to be capable in many ways.<sup>951</sup> Of these, though, the ones that are said to be capacities homonymously may be left aside (for some are said to be such because of some similarity, as in geometry we say that things are powers or non-powers because of being or not being in some way).<sup>952</sup> Those, on the other hand, that are said to be capacities relative to the same kind (*eidos*) are all starting-points, and are said to be capacities with reference to one that is primary, which is a starting-point of change in another thing or in itself insofar as it is other. For one sort is a capacity to be affected, the starting-point in the thing itself of being affectively changed by another thing or by itself insofar as it is other. Another sort is the state of being unaffected (for the worse and leading to passing away) by another thing, or by itself insofar as it is other, in virtue of a starting-point of change. For present in all these definitions is the account of the primary capacity. Again, things are said to have these capacities merely because of acting or being affected or because of acting or being affected *well*, so that even in the accounts of the latter the accounts of the former capacities are in a way present.

It is evident, then, that in a way the capacity to act and to be affected are one (for something is capable either by itself having a capacity to

be affected or by another thing having the capacity to be affected by it), whereas in another way they are distinct, since the one capacity is in what is affected.<sup>953</sup> For it is because it has in it a certain starting-point (and the matter too is a certain starting-point) that what is affected is affected, and that one thing is affected by another. For what is oily is burnable, what yields in this specific way is crushable, and similarly in the other cases. The other capacity, by contrast, is in what acts—for example, heat or the craft of building (the one in what is capable of heating, the other in what is capable of building).<sup>954</sup> That is why insofar as it is naturally unified nothing is affected by itself, since it is one, and not other.<sup>955</sup>

Also, incapacity and being incapable are the lack that is contrary to this sort of capacity, so that every capacity is for the same thing and in the same respect as the corresponding incapacity. But something is said to be a lack in many ways. For there is what does not have something and what is naturally suited to have something but does not have it, either at all or when it is natural to have it, and either in this specific way (for example, completely) or even in any way whatever. In some cases, though, where things that are naturally suited to have something do not have it due to force, we say that they have been caused to lack it.

## Θ 2

Since some starting-points of these sorts are present in inanimate things, others in animate ones, and in a soul, and in the part of the soul that has reason, it is clear that some of the capacities will be non-rational, whereas some will involve reason.<sup>956</sup> That is why all the crafts, that is, all the productive sciences, are capacities.<sup>957</sup> For they are starting-points of change in another thing or in the same thing insofar as it is other.

And all the capacities that involve reason are such that the very same one is a capacity for contraries, whereas the non-rational ones are such that one capacity is for one of them. For example, the hot is for heating only, but the craft of medicine is for both disease and health.<sup>958</sup>

The cause of this is that scientific knowledge is an account, and the same account makes clear both the positive thing and its lack, except not in the same way—that is, in a way it is of both, but in a way it is rather of the positive thing.<sup>959</sup> And so it is also necessary that these sorts of sciences should be of contraries, but of one intrinsically and of the other non-intrinsically. For the account too is of one

intrinsically and of the other, in a way, coincidentally. For it is by denial and removal that it makes the contrary clear. For the contrary is the primary lack, and this is the removal of the other [and positive] contrary.

Now since contraries do not occur in the same thing, and scientific knowledge is a capacity by having an account, and the soul has a starting-point of movement, it follows that while what is healthy produces only health, and what is capable of heating produces only heat, and what is capable of cooling produces only cold, the person with scientific knowledge can produce both of the relevant contraries. For the account concerns both, though not in the same way, and it is in a soul that has a starting-point of movement, so that the soul will move both of the relevant contraries from the same starting-point, having connected them to the same account. That is why things that are capable in accord with an account—in contradistinction to the ones capable without an account—produce contraries. For they are encompassed by one starting-point, namely, the account.<sup>960</sup>

It is also evident that while the capacity merely to act or to be affected follows along with the capacity to do so well, the latter does not always follow along with the former. For someone who does something well must of necessity also do it, but someone who merely does something need not of necessity also do it well.

### Θ 3

There are some people—for example, the Megarians—who say that a thing is capable of something only when actively doing it, and that when not actively doing it, it is not capable.<sup>961</sup> For example, someone who is not building is not capable of building, but someone who is building is capable if and when he is building, and similarly in the other cases. But it is not difficult to see that the consequences of this are absurd. For it is clear that someone will not even be a builder unless he is building (since to be a builder is to be capable of building), and similarly in the case of the other crafts. So if it is impossible to possess such crafts without at some time having learned and grasped them, and impossible not to possess them without having at some time lost them—either by forgetting them or by being affected in some way or due to time (for of course it cannot be due to the passing away of the *thing*, since it always is)—then whenever someone has stopped [building], he will not possess the craft.<sup>962</sup> And if he will straightaway start building again, how will he have [re-] grasped it?

Inanimate things too are the same way. For there will be no cold or hot or sweet or in general anything perceptible, if nothing is perceiving them, so that the supporters of this view will have to give the argument of Protagoras.<sup>963</sup> But in fact nothing will even have perception if it is not perceiving and actively so. If, then, something is blind if it does not have sight (though it is natural that it should have it) when it should naturally have it, and furthermore in the way it should naturally have it, then the same people will be blind many times in the day—and deaf too.

Further, if what is lacking capacity is incapable, then what is not happening will be incapable of happening. But someone who says of what is incapable of happening that it either is or will be says something false (for this is what incapable signified). So these arguments do away with both movement and coming to be. For what is standing will always be standing and what is sitting will always be sitting, since if it is sitting it will not get up. For what does not have the capacity to get up is incapable of getting up. So if we cannot say these things, it is evident that capacity and activity are distinct.<sup>964</sup> (For those arguments make capacity and activity the same, which is why it is no small thing that they are looking to do away with.) So it is possible for something to be capable of being and yet not to be, or capable of not being and yet to be, and similarly for the other categories—to be capable of walking and yet not to walk, and to be capable of not walking and yet to walk.<sup>965</sup> A given thing is capable if nothing impossible follows from the assumption that the activity it is said to have the capacity for belongs to it.<sup>966</sup> I mean, for example, if a thing is capable of sitting and it is possible for it to sit, if sitting should belong to it, there will be nothing impossible occurring. And similarly if it is capable of being moved or moving, of standing or making something stand, of being or coming to be, or of not being or not coming to be.

The name “activity,” which is connected to “actuality,” has been extended to other things from applying most of all to movements.<sup>967</sup> For activity seems most of all to be movement, which is why people do not assign movement to non-beings, although certain other predicates they do—for example, non-beings are objects of thought and of appetite, but are not moving, and this is because while not actively being, they will actively be.<sup>968</sup> For of non-beings, some are potentially, although they *are* not, because they *actually* are not.

If what is capable is what we said it is, or follows from it, then it is evident that it cannot be true to say that a given thing is capable of

being but will not be, so that things incapable of being would thereby vanish.<sup>969</sup> I mean, for example, suppose someone were to say that the diagonal of the square is capable of being measured, although it will not be measured—someone who is not rationally calculating that it is incapable of being so—on the grounds that nothing prevents something from being capable of being or of coming to be that neither is nor is going to be.<sup>970</sup> But, on the basis of the things laid down what is necessary is this, that if we were to *assume* something to be or to have come to be that is not, but that is capable of being, there will be nothing impossible occurring.<sup>971</sup> It *will turn out*, though, that there is, since the diagonal is incapable of being measured. For what is false and what is impossible are certainly not the same, since that you are standing now is false, but not impossible.

At the same time, however, it is also clear that if when A is the case it is necessary that B is the case, then if A is possible, it is necessary that B is possible.<sup>972</sup> For suppose it is not necessary that it is possible, then nothing prevents it from being impossible. So, let A be possible. Then, when A is possible, if A is posited as being the case, nothing impossible follows, and so of course it is also necessary for B to be the case. But B was supposed to be impossible. Let it be impossible, then. If, then, B is impossible, it is necessary that A is too. But the first was supposed to be impossible, therefore so is the second. If, then, A is possible, B will also be possible—if indeed they are so related that if A is, then B must be. If, then, when A and B are related in this way, B is not possible in the specified way, A and B will not be related as posited either. And if when A is possible it is necessary that B is possible, then if A is the case, it is also necessary that B is the case. For that B is of necessity possible if A is possible signifies this, that if ever A were the case, both when and in the way that it was supposed to be possible for it to be, then it is necessary for B to be the case at that time and in that way too.

Θ 5

As all capacities are either innate, like the perceptual capacities, or come by habit, like that of flute-playing, or by learning, like that of the crafts, in the case of some of them prior activation is necessary for their possession, namely, those that come by habit or by reason, but for those that are not of this sort, or those dealing with being affected, this is not necessary.<sup>973</sup>

Since, though, what is capable is capable of something, at some time, in some way (and however many other things must be present in the definition), and since some things are capable of producing

5 movement in accord with reason and their capacities involve reason, whereas others are non-rational and their capacities non-rational, and the rational capacities must be in an animate thing, whereas the non-rational ones can be in both an animate thing and in an inanimate one, with the non-rational capacities, whenever what is capable of acting and what is capable of being affected meet up in the way appropriate to the capacity in question, it is necessary for the one to act and for the other to be affected, but with the rational capacities it is not necessary.<sup>974</sup> For all these non-rational capacities are such that one is productive of one thing, whereas the rational capacities are productive of contrary ones, so that [if they produced them in the way the non-rational ones do] they would produce contraries at the same time. But this is impossible.

10 There must, then, be something else that is the controlling factor. I mean by this desire or deliberate choice.<sup>975</sup> For whichever of two alternatives an agent desires in a controlling way, this it will do; whenever it is such as to be capable and meets up with what is capable of being affected. And so whenever anything that is capable in accord with reason desires what it has a capacity for, in the way in which it has the capacity, it is necessary for it to do this. And it has the capacity for that thing in that way whenever the thing affected is present and in the relevant condition, and if not, it will not be capable of acting.<sup>976</sup> (For 15 it is not further necessary to add to the definition "provided nothing external prevents it."<sup>977</sup> For it has the capacity as a capacity to act, not in all circumstances, but under certain conditions, among which will be the exclusion of external things preventing it, since these are precluded by some of the things present in the definition.) That is why even if 20 someone has a wish or an appetite to do two things or contrary things at the same time, he will not do them. For it is not in this way that he has the capacity for them, nor is it a capacity to do them at the same time, since it will do the things for which it is the capacity *in the way in which it is the capacity*.

## Θ 6

25 Since we have spoken about the capacity [or potentiality] that is said [of things] with reference to movement, let us make some distinctions concerning activity, both concerning what it is and what sort of thing it is.<sup>978</sup> For the capable too will at the same time become clear as we make our determinations, because we do not say only of that which naturally moves something else, or is moved by something else, that it is capable, whether unconditionally or in a certain way, but also use

the term in a different way, which is why in the course of our inquiry we went through the former.<sup>979</sup>

Activity, then, is the existence of the thing not in the way in which we say that it exists potentially. And we say, for example, that Hermes exists potentially in the wood and the half-line in the whole, because it could be abstracted from it, and also we say that even someone who is not contemplating is a scientific knower if he is capable of contemplating. And by contrast we say that other things exist actively.<sup>980</sup>

What we wish to say is clear from the particular cases by induction, and we must not look for a definition of everything, but be able to comprehend the analogy, namely, that as what is building is in relation to what is capable of building, and what is awake is in relation to what is asleep, and what is seeing is in relation to what has its eyes closed but has sight, and what has been shaped out of the matter is in relation to the matter, and what has been finished off is to the unfinished. Of the difference exemplified in this analogy let the activity be marked off by the first part, the potentiality by the second. But things are said to actively be, not all in the same way, but by analogy—as this is in this or to this, so that is in that or to that. For some are as movement in relation to a capacity [or a potential], and the others as substance to some sort of matter.

But the unlimited, the void, and things like that are said to be potentially or actively in another way from many of the other beings—for example, from what sees or walks or is seen.<sup>981</sup> For the latter things can sometimes also be truly said to be unconditionally.<sup>982</sup> For what is seen [is said to be seen] on the one hand because it is being seen and on the other because it is capable of being seen. But the unlimited is potential not in that way, namely, that it will be actually separable, but in coming to be.<sup>983</sup> For it is the division's not coming to an end that allows this activity to be potential, not the unlimited's being separated.

Since, though, of the actions that have a limit none is an end, but all are in relation to an end (for example, making thin), and since the things themselves, when one is making them thin, are in movement in this way, [namely,] that what the movement is for the sake of does not yet belong to them, these [movements] are not cases of action, at least not of complete action, since none is an end.<sup>984</sup> But the sort in which the end belongs really is an action.<sup>985</sup> For example, at the same time one is seeing [a thing] and has seen [it], is thinking [something] and has thought [it], is understanding [something] and has understood [it], whereas it is not the case that [at the same time] one is learning [something] and has learned [it], nor that one is being made healthy and has been made healthy. Someone who is living well, however, at the same time has lived well, and is happy and has

been happy. If this were not so, these would have to come to an end at some time, as when one is making [something] thin. But as things stand it is not so, but one is living and has lived. Of these, then, one sort should be called movements and the other activities. For every movement is incomplete, for example, making thin, learning, walking, building.<sup>986</sup> These are movements and are certainly incomplete. For it is not the case that at the same time one is walking and has taken a walk, nor that one is building [something] and has built [it], or is coming to be [something] and has come to be [it], or is being moved [in some way] and has been moved [in that way], but they are different, as are one's moving and having moved [something].<sup>987</sup> By contrast the same thing at the same time has seen and is seeing, is understanding and has understood. The latter sort, then, I call an activity, the former a movement.

What actual being is, then, and what sort of thing it is, should be clear to us from these and other similar considerations.

## ⊕ 7

But when a given thing is potentially something, and when it is not, must be determined. For it is not potentially something at just any time whatsoever. For example, is earth potentially a human? Or is that not so, but rather when it has already become seed, and perhaps not even then?<sup>988</sup> It is just like the way not everything can be made healthy, whether by the craft of medicine or by luck, rather, there is a certain sort of thing that is capable of being made healthy, and this is what is potentially healthy. And the defining mark of what, as a result of thought, comes to be actual from what is potential is that, when it is wished for, it comes about if nothing external prevents it, while on the other side—namely, in what is being made healthy—it is when nothing in it prevents it.<sup>989</sup> Similarly too with what is potentially a house: if none of the things in this—that is, in the matter—prevents it from coming to be a house, and if there is nothing which must be added, subtracted, or changed, then this is potentially a house, and the same is true for each of the other things for which the starting-point of coming to be is external.

And for the things, then, that have the starting-point within themselves, each is potentially each of the things—if nothing external prevents it—that it will come to be because of itself. For example, the seed is not yet potentially a human (for it needs to be placed in something else and to change); but when, because of a starting-point that belongs to itself, it is already in the latter state, it is already potentially



human.<sup>990</sup> The seed, though, needs another starting-point, just as earth is not yet potentially a statue (for it is after having changed that it will be bronze).

It seems that when we say that something is not this but rather *thaten*—as, for example, we say that a box is not wood but wooden, and the wood not earth but earthen, and again with earth if it is similarly not another this but rather *thaten*—the latter is always unconditionally the next one up potentially.<sup>991</sup> For example, the box is not earthen nor earth but wooden. For this is potentially a box and this is matter of a box—the wood unconditionally of the box unconditionally, and of this box, this wood. But if there is something primary that is no longer said to be *thaten* with reference to something else, then this is prime matter—for example, if earth is [not air but] *airen*, and air is not fire but *firen*, fire is prime matter, because it is not a this something.<sup>992</sup>

For the that of which [something is said], or the underlying subject, differs in this way, namely, by being or not being a this something. The underlying subject for attributes is, for example, a human, both body and soul, while the attribute is the musical or the pale. For when music is present in it the thing is said to be not music but musical, and the human not pallor but pale, and not a walk or a movement but walking or moving—as with *thaten*. So in cases like this, the ultimate underlying subject is substance. But in cases that are not like this, but where what is predicated is a form and a this something, the ultimate underlying subject is matter and material substance.<sup>993</sup> And so it quite correctly turns out that things are said to be *thaten* both with reference to their matter and to their attributes. For both are indefinite.<sup>994</sup>

It has been stated, then, when something should be said to be potentially something and when not.

⊕ 8

Since it has been determined in how many ways things are said to be prior, it is evident that activity is prior to potentiality.<sup>995</sup> And I mean by potentiality [or capacity] not only that defined sort that is said to be a starting-point of change in another thing, or in another thing insofar as it is other, but also all starting-points of change or remaining at rest in general.<sup>996</sup> For nature is also in the same kind (*genos*) as potentiality. For it is a starting-point of movement—not, however, in another thing but in the thing itself insofar as it is itself. To all this sort of potentiality, then, activity is prior both [1] in account and [3] in substance, whereas [2] in time it is prior in one way and in another not.<sup>997</sup>

[1] Well, that it is prior in account is clear. For what is in the primary way potential is potential because it admits of becoming active—for example, by “capable of building” I mean what is capable of [actively] building, and by “capable of seeing” what is capable of [actively] seeing and by “capable of being seen” what is capable of [actively] being seen. And the same account also applies in the other cases, so that it is necessary for the account and the knowledge of the one to precede the account and knowledge of the other.

[2] In time activity is prior in this way: the active that is the same in form, though not in number, is prior. I mean this, that to this human who is already actively what he is, and to the corn and to what is [actively] seeing, the matter and the seed and what is capable of seeing, which are potentially a human and corn and seeing, but not yet actively so, are prior in time.<sup>998</sup> Prior in time to these, however, are other things that are actively what they are, from which these came to be. For what actively is always comes to be from what potentially is as a result of what actively is (for example, human from human, musician as a result of musician), there being always a first mover; and the [first] mover already actively is. For it was stated in the accounts concerned with substance that everything that comes to be, comes to be something, from something, and as a result of something, and this is the same in form as it.<sup>999</sup>

That is also why it seems impossible for someone to be a builder if he has built nothing or a harpist if he has never played the harp. For someone who learns to play the harp learns to play the harp by playing the harp, and similarly too for the other learners. It is from this that the sophistical refutation arises, that someone who does not have scientific knowledge will be doing what the scientific knowledge is knowledge of, since someone who is learning does not have it.<sup>1000</sup> But because something of what is coming to be must have come to be, and in general something of what is moving must have moved (this is made clear in the discussions concerning movement), the one who is learning too must presumably have something of the science.<sup>1001</sup> Well then it is also clear even in this case that activity is prior in this way as well to potentiality, namely, in coming to be and time.

[3a-i] But surely it is also prior even in substance, first, because the things that are posterior in coming to be are prior in form and in substance—for example, man to boy and human to seed (for the one already has the form, while the other does not)—and because everything that comes to be proceeds toward a starting-point and an end (for the for-the-sake-of-which is a starting-point, and the coming to be is for the sake of the end), and the activity is the end, and it is for the

sake of this that the capacity [or potentiality] is acquired. For animals do not see in order that they may have sight, rather they have sight in order that they may see, and similarly too they have the craft of building in order that they may build and the capacity to contemplate in order that they may contemplate. But they do not contemplate in order that they may have the capacity to contemplate, except those who are practicing, and they do not contemplate except in this way, or because they have no need to contemplate.<sup>1002</sup>

[3a-ii] Further, the matter is potentially something because it may come in the form of it—at any rate, when it is actively something, then it is in the form of it. Similarly too in the other cases, even those in which the end is a movement.<sup>1003</sup> That is why, just as teachers think that they have delivered the end result when they have demonstrated [their student] in activity, nature also does likewise. For if it does not happen in this way, it will be like Pauson's Hermes, since it will even be unclear whether the scientific knowledge is inside or outside, just as with that figure.<sup>1004</sup> For the function is the end, and the activity is the function, and this is why the name "activity" is said of things with reference to the function, and extends to the actuality.<sup>1005</sup>

[3a-iii] And, whereas in some cases it is the use that is the ultimate thing (for example, seeing in the case of sight, and nothing else beyond this comes to be from the function of sight), from other things something [else] does come to be (for example, from the craft of building a house comes to be that is beyond the activity of building), yet the use is in the former case no less the end, and in the latter case more the end, than the capacity is. For the activity of building is in what is being built and comes to be and is at the same time as the house. In the cases, then, where what comes to be is some other thing beyond the use, in those cases the activity is in what is being produced—for example, the activity of building is in what is being built, the activity of weaving is in what is being woven, and similarly in the other cases, and in general the movement is in what is being moved.<sup>1006</sup> But in all the cases where there is not some other work beyond the activity, the activity is in the relevant things—for example, the seeing is in the one who sees, the contemplating in the one who contemplates, and the living in the soul (which is why happiness is also in it, since it is a certain sort of living).<sup>1007</sup> So it is evident that the substance and the form are activity.<sup>1008</sup>

In accord with this argument, then, it is evident that activity is prior in substance to potentiality, and, as we have said, one activity always precedes another in time until we reach the activity of what primarily and eternally causes movement.<sup>1009</sup>

[3b] But then activity is also prior in a more controlling way.<sup>1010</sup> For eternal things are prior in substance to things that pass away, and nothing eternal exists potentially.<sup>1011</sup> Here is the reason. Every capacity [or potentiality] is at the same time for something and for the contradictory.<sup>1012</sup> For while what is incapable of belonging cannot belong to anything, everything that is capable admits of not being active. So what is capable of being admits both of being and of not being. So the same thing is capable both of being and of not being. But what is capable of not being admits of not being. And what admits of not being can pass away, either unconditionally or in that way in which it is said to admit of not being, namely, with respect to place, or to quantity, or to quality—"unconditionally" is "with respect to substance."<sup>1013</sup> So none of the things that cannot unconditionally pass away are unconditionally potential (although nothing prevents one from being so in a certain respect—for example, with respect to quality or place). So all of them are actively [what they are]. Nor are any of the necessary beings potential ones (and yet these are primary things, since if they were not, nothing would be).<sup>1014</sup> Nor, then, is movement potential, if some movement is eternal. Nor, if there is something that is eternally moved is it moved in accord with a capacity [or potentiality], except from somewhere to somewhere (for nothing prevents matter for this sort of movement from belonging to it).<sup>1015</sup>

That is why the sun, the stars, and the whole heaven are always active, and there is no fear that they may sometime stand still, which is what those concerned with nature fear, nor do they get tired doing this.<sup>1016</sup> For movement is not for them connected with a capacity for the contradictory, as it is for things that can pass away, so that the continuity of the movement is laborious, since the substance that is matter and potentiality, and not activity, is what causes this.

The things that cannot pass away are also imitated by things that are involved in change—for example, earth and fire.<sup>1017</sup> For these too are always active, since they have their movement both intrinsically and within themselves.<sup>1018</sup> But the other capacities, from what has been determined about them, are all for something and for the contradictory. For what is capable of moving something in this way is also capable of moving it not in that way—at any rate, in all cases that are in accord with reason. And the same non-rational capacities will, by their presence or non-presence, be for something and for its contradictory.

So if there are some natures or substances of the sort that the people involved in accounts say the Ideas are, then there will be something that is much more of a science than science-itself, and much more of a

movement than movement [-itself]. For the former are more activities and the latter capacities for them.

1051<sup>a</sup>1

It is evident, then, that activity is prior both to potentiality and to every starting-point of movement.

⊙ 9<sup>1019</sup>

It is clear from the following considerations, however, that the activity is also better and more estimable than the excellent capacity.<sup>1020</sup> For in the case of those things that are said to be with reference to being capable, the same one is capable of contraries—for example, the same thing that is said to be capable of being healthy is also capable of being sick, and at the same time.<sup>1021</sup> For the same capacity is the capacity to be healthy and to be sick, to be resting and to be moving, to build and to demolish, and to be built and to collapse. The capacity for contraries, then, is present at the same time.

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For the contraries to be present at the same time, however, is impossible, and for the activities to be present at the same time is impossible (for example, being healthy and being sick), so that it is necessary for the good to be one or the other of them. But being capable is of both alike, or of neither. So the activity is better.<sup>1022</sup> And it is necessary in the case of the bad things, too, for the end and the activity to be worse than the capacity. For the same thing is capable of both contraries.<sup>1023</sup> It is clear, therefore, that the bad does not exist beyond the things. For the bad is posterior in nature to the capacity.<sup>1024</sup> Neither, therefore, in the things that there are from the start nor in the eternal things is there anything bad or in error or corrupted (for corruption is also something bad).<sup>1025</sup>

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And geometrical diagrams are discovered actively.<sup>1026</sup> For people discover them by actively dividing. If they had already been divided, they would be evident. But as it was they were present potentially. Why are the interior angles of a triangle equal to two right angles? Because the angles around one point are equal to two right angles. If, then, the line had already been drawn upward parallel to the side, why this is so would be immediately clear on seeing it.<sup>1027</sup> Why is the angle in a semicircle universally a right angle? Because if three lines are equal, namely, the two that form the base and the one dropped straight from the center, then it is clear on seeing it to the person who knows that.<sup>1028</sup>

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So it is evident that the things that are potential are discovered when they are actively drawn.<sup>1029</sup> And the cause of this is that understanding is the activity, so that what is potential [is discovered] from the activity,

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and because of this they know by [actively] producing, since the single activity is posterior in coming to be.<sup>1030</sup>

© 10<sup>1031</sup>

Since something is said to be or not to be, [1] in some cases with reference to the figures of predication, [2] in others with reference to the potentiality or activity of these or to their contraries, and [3] in others by being in the fullest way true or false, and since this, in the case of the things, is being combined or being divided, so that a person grasps what is true when he thinks what is divided to be divided or what is combined to be combined, whereas he grasps what is false when his state is contrary to that of the things—when is there and when is there not what we call true or false?<sup>1032</sup> For what we mean by this must be investigated. For it is not because we truly think you to be pale that you are pale, but it is because of your being pale that we who say this grasp what is true.

So if some things are always combined and it is impossible for them to be divided, and others are always divided and it is impossible for them to be combined, while others admit of both contraries, then, while to be is to be combined and one, not to be is not to be combined and many. Where the things that admit of both contraries are concerned, then, the same belief or the same account comes to be false and true, and admits at one time of grasping what is true and another time of grasping what is false, but where the things that cannot be otherwise are concerned, it does not come to be at one time true and at another time false, rather, the same ones are always true or always false.<sup>1033</sup>

Where the incomposite things are concerned, then, what is being or not being and what is truth and falsehood? For they are not composite, so that they would be if combined and not be if divided, like the pale and the log or the incommensurable and the diagonal, nor will truth and falsehood still hold in the same way in their case. Or, rather, just as truth is not the same in their case, neither is being. Instead, truth or falsity consists in this—to touch and to announce is true (for affirmation and annunciation are not the same), but to be ignorant is not to touch, since it is not possible to be mistaken about the what-it-is, except coincidentally.<sup>1034</sup> The same holds, too, with regard to incomposite substances, for it is not possible to be in error about them.<sup>1035</sup> And they are all active, not potential. For otherwise they would have come to be and passed away. But as things stand being does not itself come to be or pass away, since if it did, it would have to come to be from something.<sup>1036</sup>

Thus, with regard to those things that are just what something is and activities, it is not possible to be in error, but either to understand or not understand, but where they are concerned, their what-it-is is inquired into, whether they are such-and-such or not.<sup>1037</sup> With being as truth and not being as falsehood, by contrast, one sort, if it is in fact combined, is true, while if it is not combined, it is false, the other sort is if indeed it is a being in this way, while if it is not [a being] in this way, it is not. But truth is understanding these things, whereas falsehood does not exist and neither does any error, but ignorance does exist, though it is not like blindness, since blindness would be like wholly lacking the part that understands.<sup>1038</sup>

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1052<sup>a</sup>1

It is evident, too, that about the immovable things there can be no mistake as regards time, if we take them to be immovable.<sup>1039</sup> For example, if we think that the triangle does not change, then we will not think that at one time it has interior angles equal to two right angles but that at another time it does not (for in that case it would change). But [we can think] that one sort is and another sort is not, for example, [we can think] that no even numbers are prime, or that some are and some are not. But about a single thing that is one in number not even this [sort of mistake can occur]. For we will no longer think that one thing is and another is not, but will grasp what is true or grasp what is false as always being that way.

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## BOOK IOTA (X)<sup>1040</sup>

### Iota 1

15 It was stated previously, in our discussions concerning how many the ways are in which things are said, that things are said to be ONE in many ways.<sup>1041</sup> But though they are said to be so in more ways than this, there are four ways of bringing together under headings the things that are said to be primarily and intrinsically, not coincidentally, one.

20 [1] There is the continuous, either unconditionally or most so by nature, and not by contact or by being tied together (and of these, what is more one and prior is what has a more indivisible and more simple movement).

25 [2] Further, even more like this is what is a whole and what has a certain shape and form, and most so if it is like this by nature and not by force, as things are that are glued or nailed or tied together, but has within itself the cause of its own continuity. And it is like this because its movement is one and indivisible in place and in time, so that it is evident that if something has by nature a starting-point of movement that is the very first of the first sort (I mean circular spatial movement as the first sort of spatial movement), then it is the primary thing that is one in magnitude.<sup>1042</sup>

30 Some things, then, are one in this way, namely, by being continuous or whole, whereas the other things that are one are those whose account is one. And things of this sort are things of which the understanding is one, and things of *this* sort are things of which the understanding is indivisible, and it is indivisible when the thing is indivisible in form or in number.<sup>1043</sup> [3] In number, then, the particular is indivisible, whereas [4] in form it is what is so in knowability and in scientific knowledge, so that the primary thing that is one would be the cause of substances' being one.<sup>1044</sup>

35 Things, then, are said to be one in this many ways: [1] the continuous by nature and [2] the whole, [3] the particular, and [4] the universal. And all these are one because of the indivisibility in some cases of their movement and in others of their understanding or their account.

1052<sup>b</sup>1 We must understand, though, that the following should not be taken to be equivalent: What sorts of things are said to be one? and What is the being for a one? That is, what is the account of it? For things are said to be one in this many ways, and each thing will be one



when one of these ways of being one belongs to it. But the being for a one will sometimes be the being for one of these things and sometimes for something else that is even closer to the name, while the former things are closer to its capacity.<sup>1045</sup> It is just as is the case with "element" or "cause," if we had to speak about them both by distinguishing the things to which they apply and by giving the definition of the names. For in one way fire is an element (or perhaps what is intrinsically so is the unlimited or something else of that sort), whereas in another way it is not. For the being for fire and the being for an element are not the same.<sup>1046</sup> For although, as a thing and a nature, fire is an element, what the name ["element"] signifies is that *this* belongs to it, namely, that something is *from this* as a primary component. And it is that way, too, in the case of "cause" and "one" and all such things.

That is also why the being for one is the being for indivisible, namely, being just a this and on its own, separable either in place or in form or in thought, or again being whole and indivisible, but most of all the being for a first measure of each genus, and, in the fullest way, of that of quantity. For it is from this that it has been extended to the others. For a measure is that by which quantity is known, and a quantity insofar as it is a quantity is known either by a one [or a unit] or by a number, and all number by a one, so that all quantity insofar as it is quantity is known by the one, and what quantities are primarily known by, this is itself one. That is why the one is the starting-point of number insofar as it is number. And, by extension from this, so too in the other genera what is said to be a measure is the primary thing by which each is known, and the measure of each thing is a one [or a unit], in length, in breadth, in depth, in weight, in speed. (Weight and speed are common to both contraries.<sup>1047</sup> For each is twofold—for example, weight is both what has any tendency of whatever degree to move down and what has an excessive tendency to move down, and speed is what has any amount of movement whatever and what has an excess of movement. For there is some speed even of the slow, and weight of the lighter.)

In all these, then, the measure and starting-point is something that is one and indivisible, since even in lines we use the one-foot line as indivisible. For everywhere people seek as a measure something that is one and indivisible. And this is the simple in either quality or quantity. Now, where it seems impossible to take away or add, this measure is exact, which is why that of number is most exact—for people posit the unit as in every way indivisible. And in the other cases they imitate this sort of measure. For in the case of a stade [two hundred yards], a talent [six thousand drachmas], or anything comparably large, some addition or subtraction might more readily escape notice than in the

case of something smaller. So the first [or primary] thing from which,  
 5 as far as perception goes, that cannot happen, this is what everyone  
 makes a measure, whether of liquids or of solids, weight or magnitude,  
 and they think they know the quantity when they know it by means of  
 this measure.

Indeed, people think they know movement too by the movement  
 that is simple and fastest, since this takes the least time. That is why in  
 10 astronomy a one [or unit] of this sort is a starting-point and measure  
 (for they posit the movement of the heaven to be uniform and fastest,  
 and judge the others relative to it).<sup>1048</sup> And in music, it is the quarter-  
 tone (because it is the smallest interval), and in speech the phonetic  
 element. And all these are one something in this way—not that a com-  
 mon something is the one [or unit] in all, but in the way we stated. The  
 measure, though, is not always one in number, but sometimes there are  
 15 several. For example, the quarter-tones are two (not to hearing but in  
 the ratios involved), and the voiced sounds by which we measure are  
 several, and the diagonal is measured by two measures, and so are all  
 magnitudes.<sup>1049</sup>

In this way, then, the measure of all things is the one [or unit], in  
 that we come to know the things from which substance [is constituted]  
 when we divide either with respect to quantity or with respect to the  
 20 form. And it is because of this that the one is indivisible, namely, that  
 the primary measure of each of these is indivisible. But not every mea-  
 sure is indivisible in the same way—for example, a foot and a unit.  
 Instead, a unit is so in every way, whereas a foot must be placed among  
 the things that are perceptually indivisible, as has already been said,  
 since presumably everything continuous is divisible.<sup>1050</sup>

(The measure is always in the same genus as what is measured. For  
 25 that of spatial magnitudes is a spatial magnitude, and in particular that  
 of length is a length, that of a breadth a breadth, that of voiced sound a  
 voiced sound, that of weight a weight, that of units a unit. For this is the  
 way we must take the last one, and not “that of numbers is a number.”  
 And yet it would be necessary, if it were taken in a similar way to the  
 others. But it is not really a similar claim. On the contrary, it would be  
 like claiming that the measure of units is units, and not *a* unit. But a  
 30 number is a plurality of units.<sup>1051</sup>)

Also, we say that scientific knowledge is a measure of things, as is  
 perception, because of the same thing, namely, that we come to know  
 something by them, since really they are measured more than they  
 measure. It is as if someone else measured us and we came to know  
 how big we are by seeing that he applied the cubit-measure to such-  
 35 and-such a fraction of us. But Protagoras says that “man is the measure

of all things," as if he had said "the man who has scientific knowledge" or "the man who perceives," and that these are the measure because they have in the one case perception and in the other case scientific knowledge, which we say are measures of the underlying objects.<sup>1052</sup> People who say what Protagoras says, then, are saying nothing, though they appear to be saying an extraordinary thing.<sup>1053</sup>

1053<sup>b</sup>1

It is evident, then, that the being for a one [or for a unit], when defined with regard to the meaning of the name, is most of all a certain measure, and in the fullest sense of quantity, and after that of quality. And one thing will be of this sort if it is indivisible with respect to quantity, and another if it is so with respect to quality, which is why the one [or unit] is indivisible, either unconditionally or insofar as it is one.

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## Iota 2

With regard to the substance and the nature of THE ONE, however, it must be investigated in which of two ways it stands, just as in going through the puzzles we went through what the one is and how we should get a grasp on it, whether we must grasp the one itself as being a certain substance (as the Pythagoreans say earlier and Plato later), or whether instead a certain nature underlies it, and we should say what the one is in some more familiar way and more in the manner of those concerned with nature—in fact, of these, one says that the one is love (*philia*), another air, and another the unlimited.<sup>1054</sup>

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If, then, none of the universals can be substance, as has been said in the accounts concerned with substance and with being, and because being cannot itself be substance in the sense of some one thing beyond the many (since it is common [to all of them]), but instead is only something predicated, clearly the one cannot be substance either, since being and the one are the most universally predicated things of all.<sup>1055</sup> So the genera are neither certain natures and substances separable from the other things nor—due to the same causes as in the case of being and substance—can the one be a genus.<sup>1056</sup>

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Further, the same must hold in all cases. Things, though, are said to be one and to be in the same number of ways. So if indeed among qualities the one is a certain thing and a certain nature, and similarly too among quantities, it is clear that it must be investigated *in general* what the one is, just as with what being is, on the grounds that it is not enough to say that its nature is just this [namely, to be one or to be]. But then among colors, the one is a color, namely, the white, and so

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the other colors are seen to come to be from this and the black, and the black is the lack of white, just as dark is of light.<sup>1057</sup> So if beings were colors, then beings would be a certain number, but of what? Clearly, of colors. And the one [or unit] would be a certain one, namely, the white. Similarly, if beings were melodies, they would be a number, this time of quarter-tones. But the substance of them would not be a number, and the one would be something whose substance was not the one but the quarter-tone. And similarly in the case of sounds, beings would be a number of phonetic elements, and the one would be a thing voiced.<sup>1058</sup> And if they were rectilinear figures, they would be a number of figures, and the one would be the triangle. And the same account applies to the other genera. So if indeed in affections, in qualities, in quantities, and in movement there are numbers and a certain one, in all of them the number is a number of certain things and the one is one something, but the substance is not this itself. And the same must hold in the case of substances, since the same holds in all cases.

It is evident, then, that the one [or unit] is a certain nature in every genus and that in no case is its nature just this, the one, rather, just as in colors the one itself that must be investigated is one color, so too in substance the one itself is one substance. And that the one in a way signifies the same as being is clear from the fact that it follows along with the categories in the same number of ways and from its not being in any category (for example, not in the what-it-is and not in quality either, but instead it has the same relation to these as being does); from the fact that no other thing is additionally predicated in "one human" than in "human" (just as the being is not something beyond the what or quality or quantity); and from the fact that being for the one is just the being for the given thing.<sup>1059</sup>

### Iota 3

THE ONE and THE MANY are opposed in several ways, of which one is that of the one and the plurality as the indivisible and the divisible. For what is either divided or divisible is said to be a sort of plurality, whereas what is indivisible or not divided is said to be one. Since, then, oppositions are of four sorts, and one of the opposites is said of things as a lack, they must be contraries, and be said neither as contradictory nor as relatives.<sup>1060</sup> And the one is said to be [what it is] and is made clear from the contrary, the indivisible from the divisible, because what is a plurality and divisible is more perceptible than what is indivisible, so that in account the plurality is prior to the indivisible because of

perception. And with the one belong—as we diagrammed in our division of the contraries—the same, the similar, and the equal, and with plurality, the other, the dissimilar, and the unequal.<sup>1061</sup>

Things, though, are said to be the SAME in many ways.<sup>1062</sup> One way is that we sometimes say they are the same with respect to number.<sup>1063</sup> Another is if they are one both in account and in number—for example, you are said to be one with yourself both in form and in matter. Further, if the account of their primary substance is one—for example, equal straight lines are the same, as are equal and equiangular quadrilaterals, although they are many; but in these equality constitutes oneness.<sup>1064</sup>

Things are SIMILAR if, while not being unconditionally the same, nor without difference with respect to their composite substance, they are the same with respect to their form, as the larger square is similar to the smaller.<sup>1065</sup> And unequal straight lines are similar—similar, yes, but not unconditionally the same. Other things are similar if, having the same form, and being things in which more and less occurs, they are neither more nor less than each other.<sup>1066</sup> Other things, if they have attributes that are in form one and the same (for example, the white) to a greater or lesser degree, are said to be similar because the form of these is one. Other things if they have more of the same than of different attributes, either unconditionally or the more prominent ones—for example, tin is like silver insofar as it is white, and gold is like fire insofar as it is yellow and red.

Hence it is clear that things are also said to be DISTINCT [or OTHER] and DISSIMILAR in many ways.<sup>1067</sup> That is, on the one hand, they are said to be distinct or the same in opposite ways, which is why everything is related to everything either by being the same or by being distinct, but, on the other hand, they are said to be distinct unless both their matter and their account are one (which is why you and your neighbor are distinct).<sup>1068</sup> And the third way things are said to be distinct is the way the objects of mathematics are.<sup>1069</sup> Because of this, then, everything can be said to be distinct or the same in relation to everything, that is, of those said to be one and to be.<sup>1070</sup> For distinct is not the contradictory of same, which is why it is not said of non-beings (whereas it is said that they are not the same), but all beings are said to be distinct.<sup>1071</sup> For everything that is and is one is by its nature either one or not one [with such a thing].

The distinct, then, and the same are opposed in this way. But DIFFERENCE is not the same as distinctness. For the distinct and what it is distinct from are not necessarily distinct in some respect (for whatever is a being is either distinct or the same), but the different is different

from something in some respect, so that there must be something that is the same whereby they differ. And this thing that is the same is genus or species. For all things that differ, differ either in genus or in species—in genus if the things do not have their matter in common and if there is no coming to be from one to the other (for example, things whose figure of predication is not the same), and in species if they have the same genus (what is said to be a genus is that same thing which both of the different things are said to be with respect to their substance).<sup>1072</sup>

CONTRARIES are different and contrariety is a sort of difference.<sup>1073</sup> It is clear from induction that this hypothesis is correct.<sup>1074</sup> For all these contraries too are evidently different and not merely distinct, rather, some are distinct in genus, whereas others are in the same line of predication, and so in the same genus, and the same in genus.<sup>1075</sup> It has been determined elsewhere what sorts of things are the same or distinct in genus.<sup>1076</sup>

#### Iota 4

Since things that differ can differ from each other more or less, there is also a sort of greatest difference, and this I call CONTRARIETY. It is clear from induction that it is the greatest difference. For things that differ in genus do not have a route to each other, but are too far distant, and not comparable.<sup>1077</sup> And for those that differ in species, the comings to be are from the contraries as extremes, and the distance between the extremes is greatest, so that it is also greatest between the contraries.

But surely the *greatest* in each genus is complete.<sup>1078</sup> For the greatest is what cannot be exceeded, and a complete thing is that outside of which no part can be found. For the complete difference has an end (just as the other things are said to be complete due to having an end), and outside the end there is nothing. For in everything the end is the extreme and encompasses everything else, which is why there is nothing outside it. For the complete needs nothing further.

From these considerations, then, it is clear that contrariety is complete difference. But as things are said to be contraries in many ways, the completely contrary will follow along with the ways that being contrary belongs to them.<sup>1079</sup>

These things being so, it is evident that one thing cannot have more than one contrary (for there cannot be anything more extreme than the extreme and there cannot be more than two extremes of the same extension), and in general if contrariety is a difference, and a

difference is between two things, then so too must be the complete difference.<sup>1080</sup>

But the other definitions of contraries must also be true. For [1] the complete difference is the greatest difference, since outside the things that differ in genus or in species no further difference can be found. For it has been shown that in relation to things outside the genus there is no difference, whereas in the ones in the genus the complete difference is the greatest.<sup>1081</sup> Also, [2] the things in the same genus that differ the most are contraries, since the complete difference is the greatest difference between these. Also, [3] the things in the same receptive subject that differ the most are contraries, since the matter for contraries is the same. And [4] the things that fall under the same capacity that differ the most are contraries (for the science that is one science is also concerned with one genus), and in these the complete difference is the greatest.<sup>1082</sup>

The primary contrariety, however, is that between having and lacking—not every sort of lacking, though (for something is said to lack something in many ways), but the sort that is complete. And the others will be said to be contraries with reference to these, some because they have these, others because they produce or are productive of them, others because they are acquisitions or losses of these or of other contraries.

If, then, the sorts of opposition are contradiction, lack, contrariety, and relatives, and of these the primary sort is contradiction, and of a contradiction there is no intermediate, whereas contraries do admit of one, then it is clear that contradiction and contraries are not the same. But lack is a sort of contradiction. For both what is entirely incapable of having something and what is naturally such as to have it but yet does not have it, is lacking in it, either generally or in some definite way (indeed here we are already saying that something lacks something in many ways, which we have distinguished elsewhere).<sup>1083</sup> Hence a lack is a sort of contradiction or incapacity, which is either definite or taken in combination with the receptive subject, which is why there is no intermediate of a contradiction, whereas for a sort of lack there is one. For while everything is either equal or not equal, not everything is either equal or unequal, or if indeed it is, it is only in what is receptive of the equal.

If, then, the comings to be in the matter are from contraries, and proceed either from the form and the having of the form or from a sort of lack of the form and the shape, it is clear that every contrariety would be a lack, but presumably not every lack is a contrariety (the cause of this is that there are many different ways in which what

is lacking something admits of lacking it), since it is *the extremes* from which the changes proceed that are contraries.<sup>1084</sup> And this is also evident through induction. For every contrariety has a lack as one of its contraries, but not all cases are alike. For on the one hand inequality is the contrary of equality, and unlikeness of likeness, but on the other, vice is the contrary of virtue, and these cases differ in the way that has been stated.<sup>1085</sup> For it is one case if the thing is simply lacking, it is another if it is so at a certain time or in a certain way—for example, at a certain age or in the controlling part—or throughout.<sup>1086</sup> This is why in some cases there is something intermediate, and a human can be neither good nor bad, and in others there is not, rather, a number is necessarily either odd or even. Further, some contraries have a definite underlying subject, whereas others do not. So it is evident that one of the contraries is said of things as a lack. But it is enough if this is true of the primary ones, that is, the generic contraries (for example, the one and the many), since the others lead back to these.<sup>1087</sup>

## Iota 5

But since one thing has one contrary, we might raise a puzzle about how THE ONE is opposed to THE MANY, and THE EQUAL TO THE GREAT AND THE SMALL.—For if we say whether it is so-and-so only in an antithesis, such as whether it is white or black or, whether it is white or not white (since we do not ask whether it is human or white, unless we are proceeding on a hypothesis and inquiring about whether it was Cleon who came or Socrates). But this is not a necessary antithesis in any genus. Yet even it derives from the case of opposites, since only opposites cannot be present at the same time, and we make use of this fact here too in asking whether it was the one or the other who came. For if it were possible for both to have come at the same time, the question would be ridiculous. But if it is possible for both to have come at the same time, even so the question falls just as much into an antithesis, namely, that of the one or the many, that is, we ask whether both came or one of the two.—If, then, the question whether so-and-so is always concerned with opposites, and it is asked whether something is greater or less or equal, what is the opposition of the equal to these? For it is not contrary to either alone or to both. For why should it be contrary to the greater rather than to the less?

Further, the equal is contrary to the unequal, so that it will be contrary to more than one thing. If, on the other hand, the unequal signifies the same as both the greater and the less together, then the equal



will be opposite to both (and the puzzle supports those who say that the unequal is a dyad), but it follows that one thing is contrary to two, which is just impossible.<sup>1088</sup> 10

Further, the equal is evidently intermediate between great and small, but no contrariety is evidently intermediate or, from its definition, can possibly be so (since it would not be complete if it were intermediate between something), rather, it always has something that is intermediate within itself.<sup>1089</sup>

It remains, then, that the equal is opposed to the great and the small either as denial or as lack. Now it certainly cannot be the denial or lack of one of the two. (For why of the great rather than of the small?) Hence the equal is the lack-involving denial of both—which is also why “whether” is asked of a thing with reference to both and not just to one of the two (for example, whether it is greater or equal, or whether it is equal or less), but instead there are always three cases.<sup>1090</sup> But it is not a necessary lack, since not everything that is either not greater or not less is equal, but only the things in which these are naturally found.<sup>1091</sup> 15 20

The equal, then, is the neither large nor small but is naturally fitted to be large or small, and is opposed to both as a lack-involving denial, which is why it is intermediate between them.

Also, the neither good nor bad is opposed to both, but is nameless. For things are said to be each of these in many ways and their receptive subject is not one—rather, the neither black nor white would be more so.<sup>1092</sup> But this is not said to be one either, although the things of which this is said as a lack are in a way definite, since they must be either gray or ochre or something else like that.<sup>1093</sup> 25

So those people are incorrectly evaluating the matter who think that all such phrases are said of things in the same way, so that between shoe and hand there will be an intermediate, namely, the neither a shoe nor a hand, seeing that the neither good nor bad is intermediate between the good and the bad, as if there will be something intermediate in all cases.<sup>1094</sup> For this does not necessarily follow, since in one case there is a joint denial of opposites between which there is a certain intermediate and a certain natural extension, whereas between the other two there is not a difference, since the things jointly denied are in different genera, so that the underlying subject is not one.<sup>1095</sup> 30 35 1056<sup>b</sup>1

## Iota 6

We might also raise similar puzzles about THE ONE and THE MANY. For if the many are unconditionally opposed to the one, some impossible

things follow. For the one will then be few in the singular [so to say] or in the plural, since the many are opposed also to the few.<sup>1096</sup> Further, the two will be many, if indeed the double is a multiple, and is said of things with reference to the two. And so the one will be few. For in relation to what are the two many, if not in relation to the one and the few? For there is nothing smaller.<sup>1097</sup>

Further, if as the long and short are in length, so too in plurality are the many and the few, and if whatever is much is also many, and the many much (unless, indeed, there is a difference in the case of something continuous and easily bounded), then the few will be a plurality.<sup>1098</sup> So the one is a sort of plurality, if indeed it too is few. But it must be this, if the two are many. But perhaps, though the many are in a way said to be also much, it is with a difference—for example, water is much but not many.

Things that *are* divisible, however, are said to be many—in one way if there is a plurality that has an excess, either unconditionally or in relation to something (and few in the same way if the plurality has a deficiency), and in another way, namely, in number, and it is only in this way that the many is opposed to the one. For it is in this way that we say that something is one or many, just as if we said one and ones, or white thing and white things, or the things measured relative to the measure—and multiples are said to be one or many in the same way. For each number is said to be many because of ones, and because each is measurable by the one, and in a way that is opposed to the one, not to the few.<sup>1099</sup> In this way, then, even the two are many, but as a plurality that has an excess, either in relation to something or unconditionally, they are not, rather, they are the first plurality.<sup>1100</sup> Unconditionally, though, the two are few, since they are the first plurality with a deficiency.<sup>1101</sup> That is why Anaxagoras incorrectly abandoned his task when he said that “all things were together, unlimited both in plurality and in smallness.”<sup>1102</sup> Instead of “and in smallness” he should have said “and in fewness.”<sup>1103</sup> For they could not have been unlimited in fewness, since the few is not [what it is] because of the one, as some say, but because of the two.

The one is opposed to the many in the case of numbers, then, as measure is to measurable. But these are opposed as those relatives are that are not intrinsically relatives. We have determined elsewhere that things are said to be relatives in two ways, some as contraries, others in the way that scientific knowledge is related to the scientifically knowable, where something is said to be relative because something else is relative to it.<sup>1104</sup> Nothing, however, prevents the one from being less than something—for example, than the two. For it is not the case that if it is less, it is also few.

Plurality is (one might almost say) the genus of number. For number is plurality that is measurable by one, and so the one and number are in a way opposed—not as contrary, but in the way that we said certain relatives are.<sup>1105</sup> (For insofar as one is measure and the other measurable, in that way they are opposed, which is why not everything that is one is a number—for example, if something is indivisible it is not a number.) And though scientific knowledge is said to be in the same way relative to the scientifically knowable, the way does not turn out to be the same. For whereas scientific knowledge may seem to be the measure and the scientifically knowable what is measured, the fact is that all scientific knowledge is scientifically knowable but not all that is scientifically knowable is scientific knowledge, because in a way it is scientific knowledge that is measured by the scientifically knowable.<sup>1106</sup>

Plurality, though, is contrary neither to the few (instead, the much is contrary to it, as plurality that exceeds is to plurality that is exceeded) nor in all ways to the one. One way, however, in which they are contrary, as has been said, is because a plurality is divisible, whereas the one is indivisible, but in another way they are relative, just as scientific knowledge is to the scientifically knowable, if plurality is number and the one a measure.

### Iota 7

Since contraries admit of an INTERMEDIATE and in some cases there is one, intermediates must be composed of the contraries.<sup>1107</sup> [1] For all intermediates are in the same genus as what they are intermediates of. For [1a] we say that those things are intermediates into which what changes must change earlier—for example, if we proceed from the highest string to the lowest by the smallest intervals, we will come earlier to the intermediate notes, and, in colors, if we proceed from white to black we will come earlier to purple or gray than to black, and similarly in the other cases. But [1b] to change from one genus to another genus is not possible except coincidentally, as from a color to a shape.<sup>1108</sup> Hence, it is necessary that the intermediates be in the same genus both as each other and as what they are intermediates of.

But surely [2] *all* intermediates are between opposites of some sort, since from these alone can they intrinsically change (which is why it is impossible to be intermediate between non-opposites, since otherwise there would be change that was not from opposites).<sup>1109</sup> But of opposites, contradictories admit of no intermediate (for this is what a contradiction is, namely, an antithesis one or the other side of which must

be present in anything whatever, not having any intermediate), and of the other opposites, some are relative, others a lack, others contrary. Of relatives, those that are not contraries do not have intermediates. The cause of this is that they are not in the same genus. For what could be intermediate between scientific knowledge and scientifically knowable? But between large and small, there is one.

[3] If intermediates are in the same genus, as has been shown, and are intermediates of contraries, they must be composed of these contraries. For either there will be a genus of them or there will be none. And if [3a] there is to be a genus in such a way as to be something prior to the contraries, then the differentiae that made the contrary species as species of a genus will be contraries that are prior to these, since the species are composed of the genus and the differentiae.<sup>1110</sup> (For example, if white and black are contraries, and one is a dilating color and the other a contracting color, these differentiae—dilating and contracting—are prior, and so these are contraries of each other that are prior.<sup>1111</sup>) But then the species that are differentiated in contrary ways, at any rate, will be contraries to a higher degree. And the other species, namely, the intermediates, will be composed of their genus and their differentiae. (For example, all colors that are intermediate between white and black must be said to be composed of the genus—and the genus is color—and of certain differentiae. But these differentiae will not be the primary contraries, for otherwise every color will be either white or black. Hence they must be distinct ones. Hence they will be intermediate between the primary contraries, and the primary [contrary] differentiae are dilating and contracting.)

And so it is [3b] with regard to these contraries that are *not* within a genus that we must first inquire about what their intermediates are composed of. (For things that are in the same genus must be composed of things of which the genus is not a component, or else must be impossible.<sup>1112</sup>) Now contraries are not composed of each other, and so they are starting-points, whereas the intermediates are either all impossible, or none are. But from the contraries something comes to be, and so there will be change into it before there is one into them, since there will be less of the one in it and more of the other. Hence it too will be intermediate between the contraries. Hence all the other contraries will be composites as well. For what is more-of-this and less-of-that is a composite in some way of those things that it is said to be in the one case more of and in the other less of. And since there are no other things of the same genus that are prior to the contraries, all the intermediates must be composed of the contraries, so that all the

things downstream too, both the contraries and the intermediates, will be composed of the primary contraries.<sup>1113</sup>

It is clear, then, that the intermediates are [1] all in the same genus, [2] intermediate between contraries, and [3] all composed of the contraries.

### Iota 8

What is DISTINCT IN SPECIES is distinct from something, in something, and this latter thing must belong to both—for example, if an animal is distinct in species [from another], then both are animals. Hence [two] things that are distinct in species must be in the same genus.<sup>1114</sup> For this is the sort of thing I call a genus, that by reference to which both things are said to be one and the same, and which is not coincidentally differentiated, whether as matter or otherwise.<sup>1115</sup> For not only must the common thing belong to them (for example, that both be animals) but also this thing, the animal itself, must be distinct in each of the two (for example, in the one case horse, in the other human), which is why this, the common thing, must be reciprocally distinct in species.<sup>1116</sup> Intrinsically, then, they will be in the one case such-and-such sort of animal, in the other so-and-so sort—for example, in the one case horse, in the other human. Hence this difference must be a distinctness belonging to the genus. For by difference [or differentia] belonging to the genus I mean a distinctness that makes the genus itself distinct.

This differentia, therefore, will be a contrariety (as is also clear from induction).<sup>1117</sup> For all things are divided by opposites, and it has been shown that contraries are in the same genus.<sup>1118</sup> For contrariety was seen to be complete difference, and all difference in species is difference from something, in something, so that this latter thing is the same for both and is their genus (which is also why all contraries that are different in species and not in genus are in the same line of predication and are most distinct from each other—since the difference is a complete one—and do not come to be at the same time as each other).<sup>1119</sup> Hence the differentia is a contrariety.

Hence this is what it is for things to be distinct in species, namely, to have a contrariety while being in the same genus and being indivisible (whereas those things are the same in species that do not have a contrariety and are indivisible).<sup>1120</sup> For contraries arise in the process of division even in the intermediate stages before we come to the indivisibles. And so it is apparent that in relation to what is called the genus [1] none of the species as species of a genus is the same as it in

species or distinct from it in species (and this is as it should be, since the matter is made clear by denial, and the genus is the matter of what it is said to be the genus of—not as in “the genus of the Heraclidae” but as in “the genus that is included in the nature of that thing”).<sup>1121</sup> And [2] neither is any of them so with reference to things that are not in the same genus, but will instead differ from them in genus and differ in species from those in the same genus. For the difference belonging to what differs in species must be a contrariety; and this belongs only to things in the same genus.

## Iota 9

We might raise a puzzle, however, as to why a woman does not differ in species from a man, when female and male are contrary and their difference is a contrariety, and why a female and a male animal are not distinct in species either, even though this difference belongs intrinsically to the animal, and not as pallor or darkness does, rather, it is insofar as it is animal that both female and male belong to it.

This puzzle is almost the same as the other one, namely, why one contrariety makes things distinct in species and another does not—for example, the footed and the winged do, while pallor and darkness do not. Or is it that the former are attributes that properly belong to the genus, whereas the latter are less so? Or is it that, since one component is the account and the other the matter, contraries that are in the account produce a differentia in species, but those that are in the combination with the matter do not produce one?<sup>1122</sup> That is why a human’s paleness or darkness does not produce a differentia in species, nor is there a difference as regards species between the pale human and the dark human, not even if a single name is assigned to them.<sup>1123</sup> For it is as matter that the human is considered here, and matter does not produce a differentia, since the [particular] humans are not species of human because of it, even though the parcels of flesh and the bones of which this human and that one consist are distinct. By contrast, the compound is a distinct one, but not distinct in species [or form], because in the account there is no contrariety.

And this [species in whose account there is no contrariety] is the ultimate indivisible. Callias, by contrast, is the account with the matter; so too, then, is the pale human—because Callias is pale, and so the human is such coincidentally.<sup>1124</sup> Neither, then, do a brazen circle and a wooden one differ in species; nor do a brazen triangle and a wooden circle do so because of the matter, but because there is a contrariety present in the account.

But does the matter not produce distinctness in species, when it is in a certain way distinct, or is there a way in which it does? For why is this horse distinct in species from this human, although the accounts of them are together with the matter? Or is it that there is a contrariety present in the account? For there is also a contrariety between the pale human and the dark horse, and one in species indeed, but not insofar as the one is pale and the other dark, since even if both had been pale, they would have been different in species all the same.

Male and female, however, are attributes that do properly belong to the animal, not in virtue of its substance but in the matter—that is, the body. That is why the same seed becomes female or male when it is affected in regard to a certain attribute.<sup>1125</sup>

What it is to be distinct in species, then, and why some things differ in species, while others do not, has now been stated.

### Iota 10

Since, though, [1] contraries are distinct in species (*eidōs*), and [2] the capable of passing away and the incapable of passing away are contraries (for [3] a lack is a definite incapacity), [4] the capable of passing away and the incapable of passing away must be distinct in genus (*genos*).<sup>1126</sup>

Now so far we have been speaking of the universal names themselves, and so perhaps it might seem not to be necessary for whatever is incapable of passing away and whatever is capable of passing away to be distinct in species, just as with pale and dark.<sup>1127</sup> For the same thing can be both, and, at the same time, if it is a universal, just as the human can be both pale and dark, and, if it is a particular, it can still be both, since the same human can also (but not at the same time) be pale and dark—even though the pale is contrary to the dark.<sup>1128</sup>

But then while some contraries belong to certain things coincidentally (for example, both those just mentioned and many others), others are incapable of it, among them the capable of passing away and the incapable of passing away. For nothing is coincidentally capable of passing away, since the coincidental admits of not belonging to something, whereas the capable of passing away is among the things that belong of necessity to what they belong to—or else one and the same thing will be capable of passing away and incapable of passing away, if the capable of passing away admitted of not belonging to it. Hence the capable of passing away must either be the substance or be in the substance of each thing capable of passing away. And the argument is

the same where things incapable of passing away are concerned, since both are attributes that belong to something of necessity. Hence insofar as, and with reference to the primary thing [due to which] one thing is capable of passing away and another incapable of passing away, they have an antithesis, and so must be distinct in genus.<sup>1129</sup>

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It is evident, therefore, that there cannot be Forms of the sort that some people say there are, since then it would be the case that one man is capable of passing away and another incapable of passing away.<sup>1130</sup> Yet the Forms are said to be the same in form with the particulars and not merely to have the same name.<sup>1131</sup> But things that are distinct in kind (*genos*) are further apart than those that are distinct in form.



## K 1

It is clear from our first discussions, in which we went through the puzzles related to other thinkers' statements about the starting-points, that theoretical wisdom is a sort of science concerned with starting-points.<sup>1133</sup> [P<sub>1</sub>] We might raise a puzzle as to whether theoretical wisdom should be taken as one science or as many.<sup>1134</sup> For if as one, well, one science is always of contraries, but the starting-points are not contraries. But if as not one, of what sort must we posit these to be?

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[P<sub>2</sub>] Further, is it for one science or for more than one to get a theoretical grasp on the starting-points of demonstrations?<sup>1135</sup> For if for one, why of this science rather than for any other? But if for more than one, of what sort should we posit these sciences to be?

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[P<sub>3</sub>] Further, is it of all substances or not?<sup>1136</sup> For if not of all, it is difficult to say of which. But if there is one science of all, it is unclear how it is possible for the same science to be of more than one?

[P<sub>4</sub>] Further, is it concerned with substances alone or also with their [intrinsic] coincidents?<sup>1137</sup> For if where the [intrinsic] *coincidentes* are concerned there is demonstration, where the *substances* are concerned, there is not. But if the sciences of the two are different, what science is each of the two, and which one is theoretical wisdom? For insofar as theoretical wisdom is demonstrative, it is concerned with the [intrinsic] coincidents, whereas insofar as it is concerned with the primary things, it is of substances.<sup>1138</sup> But we must not posit, either, that the science we are inquiring into is concerned with the causes mentioned in our works on nature.<sup>1139</sup> For it is not concerned with the for-the-sake-of-which (for the good is a thing of that sort, and it belongs among things doable in action and beings involved in movement). And this is what first moves things (since the end is a thing of this sort), but in the case of immovable things there is no thing that moved them first.

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[P<sub>5a</sub>] And in general there is a puzzle as to whether the science we are now inquiring into is really concerned with the perceptible substances or not with them but with certain others.<sup>1140</sup> For if it is concerned with other ones, it must be concerned with the Forms or concerned with the objects of mathematics.

1059<sup>b1</sup>

[P<sub>6</sub>] Now, that the Forms do not exist is clear. Nonetheless, there is a puzzle—even if someone posits that they do exist—as to why on earth

what holds in the case of the other things of which there are Forms does not hold in precisely the same way in the case of the objects of mathematics.<sup>1141</sup> I mean that these thinkers posit the objects of mathematics as intermediate between Forms and perceptibles as a third sort of thing beyond both the Forms and the things we find around here, but there is not a third human or horse beyond both the thing-itself and the particulars. If on the other hand it is not as they say, what are we to posit as the sort of thing that the mathematician busies himself with? For it is certainly not with the things we find around here. For none of these is the sort of thing that the mathematical sciences inquire into. [P<sub>5b</sub>] But the science we are inquiring into is not concerned with the objects of mathematics either, since none of them is separable, nor about the perceptible substances, since they are capable of passing away.<sup>1142</sup>

[P<sub>7</sub>] In general, though, we might raise a puzzle about what sort of science it does belong to to go through puzzles about the *matter* of the objects of mathematics.<sup>1143</sup> For it does not belong to natural science, because the entire work of the natural scientist is concerned with things that have within themselves a starting-point of movement and of rest, nor yet to the science that investigates demonstration and scientific knowledge, since *this* is the kind (*genos*) of thing that it produces its investigation about.<sup>1144</sup> It remains, therefore, that it is the philosophy proposed here that conducts the investigation into those topics.<sup>1145</sup>

[P<sub>8</sub>] We might raise a puzzle, too, about whether we must posit that the science we are inquiring into is concerned with the starting-points, the ones that some people call elements.<sup>1146</sup> For these everyone posits as components of composite things. But it might seem that the science we are inquiring into must rather be of universals, since every account and every science is of universals and not of last things, so that it would thus be of the primary genera.<sup>1147</sup> But these would turn out to be being and the one, since these might most of all be supposed to encompass all beings and to be most like starting-points due to being primary in nature.<sup>1148</sup> For when they pass away, the rest are done away with along with them, since everything is a being and is one. But insofar as, if we are to posit them as genera, their differentiae must participate in them, whereas no differentia participates in its genus, in this way it would seem that we must not posit them as genera or as starting-points.

Further, if what is simpler is more of a starting-point than what is less so, and the ultimate things of which the genus is composed are simpler than the genera (for the former are indivisible, whereas the genera are divided into many different species), the species would seem to be

starting-points more than the genera. But insofar as the species are done away along with the genera, the genera seem more like starting-points. For something that does away with something along with itself is its starting-point.

The things that involve puzzles, then, are these and others of the sort.

1060<sup>a</sup>

## K 2

[P<sub>9</sub>] Further, must we posit something beyond the particulars or not, or is it rather these particulars that the science we are inquiring into is the science of?<sup>1149</sup> But they are unlimited in number. Yet the things that are beyond the particulars are genera and species, whereas the science we are now inquiring into is of neither of these. Why this is impossible has been stated.<sup>1150</sup>

[P<sub>10</sub>] And in fact there is in general a puzzle as to whether we must take it that there is some separate substance beyond the perceptible substances (that is, the ones around here), or that we must not take this to be so, but rather that these are the beings and that theoretical wisdom is concerned with them.<sup>1151</sup> For we seem to be inquiring into another sort of substance, and that this is what we proposed to ourselves here—I mean, to see whether there is something intrinsically separable that belongs to none of the perceptibles.<sup>1152</sup>

Further, if beyond the perceptible substances there is some other substance, which sorts of perceptibles must we posit this to be beyond? For why is it more so beyond the humans or the horses that we must posit this than beyond the other animals or even inanimate things generally? On the other hand, to set up other eternal substances equal in number to the perceptible ones that are capable of passing away would seem to fall outside the bounds of what is reasonable.

But if the starting-point we are now inquiring into is not separable from the bodies, what other starting-point could one better posit it to be than matter? On the other hand, this does not exist actively but potentially.<sup>1153</sup> And the form and the shape would seem to be a starting-point in a more controlling way than matter.<sup>1154</sup> But this is capable of passing away, so that there is no eternal substance at all that is separable and intrinsic.<sup>1155</sup> But this is absurd. For there seems to be such a thing, and it is inquired about by pretty much all the most sophisticated thinkers as being a starting-point and substance of this sort.<sup>1156</sup> For how will there be order without there being something eternal *and* separable *and* enduring?<sup>1157</sup>

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[P<sub>11</sub>] Further, if indeed there is a substance and starting-point of such a nature as we are now inquiring into, and if this is one for all things, and the same for both eternal things and things capable of passing away, there is a puzzle as to why on earth, if the starting-point is the same, some of the things that fall under the starting-point are eternal, while others are not eternal.<sup>1158</sup> For this is absurd. But if there is one starting-point of the things that are capable of passing away and another of the eternal things, and if that of the things that are capable of passing away is also eternal, we will face a similar puzzle. For why, if the starting-point is eternal, are the things that fall under the starting-point not also eternal? But if it is capable of passing away, there will be some other starting-point of this starting-point, and another of that one, and this will go on without limit.

[P<sub>12</sub>] Again, if we are to posit that what seem most of all to be starting-points are immovable, namely, both being and the one, then, first, if each of these does not signify a this something and substance, how will they be separable and intrinsic?<sup>1159</sup> But these are the sorts of eternal and primary starting-points that we are inquiring into. On the other hand, if each of the two does make clear a this something and substance, then all beings will be substances. For being is predicated of all things (as of some things is the one as well).<sup>1160</sup> But that every being is a substance is false. Further, in the case of those who say that the primary starting-point is the one, and that this is substance, and who from the one and the matter generate in the first place number, and say that this is substance, how can what they say possibly be true? For how are we supposed to understand the two and each of the rest of the composite numbers as one? About this they say nothing, nor is it easy to say anything.

[P<sub>13</sub>] On the other hand, if we are to posit lines or the things that come after them (I mean the primary surfaces) as starting-points, these at least are not separable substances, but cuts and divisions, some of surfaces, others of bodies (while points are cuts or divisions of lines), and furthermore limits of these same things.<sup>1161</sup> But all these are present in other things, and none is separable. Further, how are we to suppose there to be a substance of the one and the point? For there is a coming to be of every substance, but there is no coming to be of a point, since a point is a division.<sup>1162</sup>

[P<sub>14</sub>] A puzzle is also raised by the fact that every science is of the universals and of the such-and-such sort of thing, but the substance is not among the universals, but is rather a this something and separable, so that if there is a science that is concerned with the starting-points, how are we to suppose the starting-point to be substance?<sup>1163</sup>

[P<sub>15</sub>] Further, is there anything beyond the compound or not (I mean, the matter and what is with it)?<sup>1164</sup> For if not, well, things that are in matter are all capable of passing away. But if there is something, it would be the form and the shape. In which cases this is beyond the compound, however, and in which it is not, is difficult to determine. For in some cases it is clear that the form is not separable—for example, that of a house.

[P<sub>16</sub>] Further, are the starting-points the same in form or number? For if they are so in number, all things will be the same.<sup>1165</sup>

### K 3<sup>1166</sup>

Since the philosopher's science is of being qua being universally and not of a part, and since things are said to be in many ways and not with reference to one thing, it follows that if they are said to be homonymously and with reference to nothing common, then they do not fall under one science (for there is no genus of such things), whereas if it is with reference to something common, they will fall under one science.

In fact it seems that things are said to be in the way that we mentioned, namely, like medical and healthy. For we also say that things are said to be each of these in many ways. And each thing is said to be so in the relevant way—in the one case with some sort of reference to the science of medicine, in the other to health, in others to other things, but in each case to the same thing. For an account and a knife are said to be medical because the former comes from the science of medicine and the latter is useful to it. Similarly, with healthy. For one thing is said to be such because it signifies health, another because it is productive of it. And it is the same way too in the rest of the cases.

It is in this way, then, that everything is also said to be. For each of them is said to be because it is an attribute of being qua being, or a state, disposition, or movement of it, or something else of this sort. And since every being is referred to something that is one and common, each of the contrarieties too will be referred to the primary differentiae and contrarieties of being, whether the primary differentiae of being are the many and the one or similarity and dissimilarity, or some other differentiae. Let these be taken as already theoretically grasped.<sup>1167</sup> And it makes no difference whether the being in question is referred to being or referred to the one. For even if these are not the same but distinct, at any rate they are convertible, since what is one is in a way also a being, and what is a being, one.

But since every pair of contraries is to be theoretically grasped by one and the same science, and in each pair one is said of things with reference to lack of the other (although in the case of *some* contraries we might raise a puzzle as to how they can be said of things with reference to lack, namely, those that have an intermediate, like just and unjust), in all such cases, accordingly, we must posit that the lack is not of the whole account but of the complete form.<sup>1168</sup> For example, if the just man is so in accord with a state [of character] that is obedient to the laws, the unjust one will not in every case be the one who is lacking the whole account, but may be merely in some respect deficient in obedience to the laws, and it is in this respect that the lack will belong to him, and it is the same way in other cases.<sup>1169</sup>

But just as the mathematician produces his theoretical knowledge about things that result from abstraction, for he gets his theoretical grasp on them having first stripped away all the perceptible attributes (for example, weight and lightness, hardness and its contrary, and further, also heat and cold, and the other perceptible contrarieties), and leaves behind only the quantitative and the continuous (sometimes in one, sometimes in two, sometimes in three dimensions) and the attributes of things insofar as they are quantitative and continuous, and does not get a theoretical grasp on any other aspect of them, but investigates the relative positions of some and what belongs to them, and the commensurabilities and incommensurabilities of others, and the ratios of others still, but yet we posit one and the same science of all of these, namely, geometry—it is the same way, too, where being is concerned. For to get a theoretical grasp on the [intrinsic] coincidents of this qua being and on the contrarieties that belong to it qua being belongs to no other science than philosophy.<sup>1170</sup> For to natural science we would assign the task of producing theoretical knowledge not of beings qua beings, but qua having a share in movement. Dialectic and sophistry, on the other hand, although they are concerned with the coincidents of things, are not concerned with them qua beings or with being itself insofar as it is being.<sup>1171</sup> And so it remains that it is the philosopher who is capable of getting a theoretical grasp on the things we have mentioned insofar as they are beings.

But since everything is said to be with reference to something that is one and common, although so said in many ways, and contraries are in the same position (since they are referred to the primary contrarieties and differentiae of being), and since things of this sort can fall under one science, the puzzle we stated at the start would seem to be

resolved—I mean the puzzle as to how there can be one single science of beings that are many and different in genus.<sup>1172</sup>

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K 4<sup>1173</sup>

Since, however, even the mathematician makes use of the common things but in a special way, it must belong to primary philosophy to get a theoretical grasp on these starting-points also.<sup>1174</sup> For it is a fact that when equals are subtracted from equals the remainders are equal is common to all quantities, but mathematics, having cut off a part of its proper [subject-]matter, proceeds to produce theoretical knowledge about this part (for example, about lines or angles or numbers or some other sort of quantity)—not, however, qua beings, but insofar as each of them is continuous in one, two, or three dimensions.<sup>1175</sup> Philosophy by contrast does not investigate beings in part, or insofar as each of them has some coincident, but it investigates being, and each thing of that previous sort, qua being.

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Natural science too has the same way of inquiring as mathematics.<sup>1176</sup> For natural science gets a theoretical grasp on the [intrinsic] coincidents and starting-points of beings insofar as they are moving and not qua beings (whereas the primary science, we have said, is concerned with these, only insofar as the underlying subjects are beings, and not insofar as they are anything else). That is why both this science and mathematical science must be posited as *parts* of theoretical wisdom.

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## K 5

There is a starting-point in beings that we cannot be deceived about, but must always be doing the opposite, I mean, be grasping the truth—namely, that the same thing cannot at one and the same time be and not be, or admit of any other opposites in this way.<sup>1177</sup> And while there is no unconditional demonstration of such things, against a given person there is one. For it is not possible to produce a deduction of this from a more convincing starting-point, and yet we *must* do so, if indeed we are to demonstrate it unconditionally.<sup>1178</sup> But to show to the person who makes opposite affirmations that he speaks falsely, one must get the sort of thing from him that is the same as that it is not possible for the same thing to be and not to be at the same time, but that does not seem to be the same.<sup>1179</sup> For only in that way can a demonstration be given to the person who states that opposite affirmations can be truly made about the same thing.

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Those, then, who are going to join in argument with each other must to some extent comprehend each other, since if this does not happen how will there be a joining in argument with each other for these people? Accordingly, each of the names must be known and must make something clear, and not many things, but only one. And if the name signifies more than one thing, it must be made evident to which one of them it is being applied.

[A<sub>1</sub>] The person, then, who says "it is this and it is not this," says and denies that it is this, so that what the name signifies, he says it does not signify; and this is impossible.<sup>1180</sup> And so if indeed "it is this" signifies something, it is impossible for its contradictory to be true of the same thing.

[A<sub>2</sub>] Further, if the name signifies something and this states the truth, it must be that this is so of necessity.<sup>1181</sup> And what is so of necessity cannot for the relevant time not be so.<sup>1182</sup> Hence it is not possible for opposite affirmations to state the truth about the same thing.

[A<sub>3a</sub>] Further, if the affirmation no more states the truth than the denial, the person who says "[it is] a human" no more states the truth than the one who says "[it is] not a human."<sup>1183</sup> And yet it would also seem that in saying "the human is not a horse," a person would be stating the truth either more or less than in saying "[it is not] a human," so that he will also be stating the truth in saying that the same thing is a horse (for the assumption was that opposite affirmations equally state the truth). It follows, accordingly, that the same thing is a human, a horse, or any other animal.

Now none of these is an unconditional demonstration, nevertheless it is a demonstration to someone who posits the relevant things. And maybe if we had questioned Heraclitus himself in this way we would have compelled him to agree that opposite affirmations can never state the truth about the same things.<sup>1184</sup> But as things stand, he took up this belief without comprehending what he was saying.

[A<sub>3b</sub>] In any case, if what is said by him is true, not even this itself will be true—I mean, that it is possible for the same thing at one and the same time to be and also not to be.<sup>1185</sup> For just as, when separated, the affirmation no more states the truth than the denial, so in the same way—because the combined and complex affirmation is like a single affirmation—the denial will no more state the truth than the whole taken as an affirmation.

[A<sub>4</sub>] Further, if nothing can be affirmed truly, this will itself be false, namely, the affirmation that there can be no true affirmation. But if there is a true affirmation, this would refute what is



said by those who object to such things and utterly do away with discussion.<sup>1186</sup>

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## K 6

The saying of Protagoras is quite similar to the views we have mentioned.<sup>1187</sup> For he said that man is the measure of all things, which is saying nothing other than that what seems so to each person also assuredly is. But if this is so, it follows that the same thing both is and is not, and is both bad and good, and all the other things that are said in accord with opposite affirmations, because often a given thing appears beautiful to some people and the contrary to others, and what appears to each is the measure.

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This puzzle may be resolved by getting a theoretical grasp on where the starting-point of this supposition has come from. For in some cases it seems to have come about from the belief of the physicists, and in others from the fact that not all people have the same knowledge about the same things, rather, a given thing appears pleasant to some and the contrary to others.<sup>1188</sup>

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It is a belief common to pretty much all those concerned with nature that nothing comes to be from what is not, but everything from what is. Since, then, nothing white comes to be from what is completely white and is in no way not white, what becomes white must come to be from what is not white, so that it must come to be from what is not, according to them, unless the same thing was white and not white at the start. It is not difficult, though, to resolve this puzzle. For we have said in our works on nature how things that come to be do so from what is not and how they do so from what is.<sup>1189</sup>

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On the other hand, to attend equally to the beliefs of, and the ways things appear to, the disputing parties is simple-minded. For it is clear that one of them must be deceived. This is evident from what happens as regards perception. For the same thing never appears sweet to some people and the contrary to others, unless in one lot the perceptual organ by which we discern the aforementioned flavors is ruined or injured. And if this is so, then the one lot must be taken to be the measure and the other must not be so taken. And I say the same in the case of good and bad, beautiful and ugly, and other things of that sort. For maintaining the other view is no different from maintaining that what appears to people who press their finger below their eye and make a thing appear to be two instead of one must be two (because it appears to be so), and again one (for to those who do not interfere with their sight the one thing appears to be one).

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1063<sup>1</sup>

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10 In general, it is absurd to make the fact that the things we find  
around here are evidently changing and never remain the same the  
basis of our judgment about the truth.<sup>1190</sup> For it is the things that are  
always in the same state and never undergo change that we must make  
15 our basis when pursuing the truth, and this is the sort of thing that the  
heavenly bodies are. For these are evidently not now of such-and-such  
a sort and again of another sort, but are always the same and share in  
no change.

Further, if there is movement, there is also something moved, and  
everything is moved from something to something.<sup>1191</sup> Hence what is  
moved must first be in that from which it is moved and then not be in  
20 it, and must move to the other and come to be in it, and the contradic-  
tories must not be true of it at the same time, as our opponents claim  
they are.

And if with respect to quantity the things we find around here con-  
tinuously flow and move (that is, if we were to posit this even though it  
is not true), why should they not remain the same with respect to qual-  
ity?<sup>1192</sup> For the predication of contradictories of the same thing seems  
to have come about largely from the supposition that quantity does  
25 not remain the same in the case of bodies, which is why our opponents  
say that the same thing both is and is not four cubits long. But the  
substance depends on quality, and this is of a definite nature, whereas  
quantity is of an indefinite one.<sup>1193</sup>

Further, when the doctor prescribes the taking of this food [on the  
assumption that it is bread] why do they take it?<sup>1194</sup> For in what way is  
30 it bread rather than not bread? And so it should make no difference  
whether they eat it or do not eat it. But in fact, supposing themselves  
to know the truth about it and it to be the food prescribed, they take  
the food. Yet there was no necessity to do so, if no nature assuredly  
remains the same in perceptible things, but all of them are always mov-  
ing and flowing.

35 Further, if we are always altering and never remain the same, is it  
any wonder that to us, as to the sick, things never appear the same?<sup>1195</sup>  
For to them, too, because their state is not in the same condition as  
when they were healthy, perceptible things do not appear the same.  
1063<sup>b</sup>1 And yet *this* certainly does not make the perceptible things themselves  
share in any change, though they do produce different perceptions in  
the sick and not the same ones. For it to be the same way, then, with us  
5 too, if the aforementioned change occurs, is equally necessary.<sup>1196</sup> But  
if we do not change but continue as we were, there will be something  
that remains the same.

Now in the case of those who raise the aforementioned puzzles on the basis of argument, it is not easy to provide a resolution, unless they posit something for which they no longer demand an argument, since it is in that way that all argument and all demonstration comes about.<sup>1197</sup> For if they posit nothing, they do away with discussion and with argument in general.<sup>1198</sup> So with people of this sort there is no arguing. On the other hand, in the case of those who are puzzled by the traditional puzzles, it is easy to confront and resolve what causes the puzzles in them—as is clear from what has been said.<sup>1199</sup>

So it is evident from these considerations that opposite affirmations cannot state the truth about the same thing at one time, nor can contrary ones, because all contraries are said of things as a lack—as is clear if we lead the account of contraries back to their starting-point.<sup>1200</sup>

Similarly, nothing medial between contraries can be predicated of one and the same thing [as one of the contraries].<sup>1201</sup> For if the underlying subject is white, in saying that it is neither black nor white, we shall be stating a falsehood, since then it follows that it is white and not white. For the second of the two things we have combined is truly stated of it, and this one is the contradictory of white.<sup>1202</sup>

Neither, then, in speaking in accord with Heraclitus or in accord with Anaxagoras is it possible to speak the truth, since, if it were, it would follow that contraries are predicable of the same thing.<sup>1203</sup> For when Anaxagoras says that there is a part of everything in everything, he is saying that nothing is sweet any more than it is bitter, and similarly for the other sorts of contraries, if indeed everything is present in everything, not potentially only but actively and separately.

Similarly, all affirmations cannot be false nor all true, both because of many other difficulties that might be assembled as being due to this thesis and because, if all are false, it will not be true to state even it, whereas, if all are true, it will not be false to state that all are false.

### K 7<sup>1204</sup>

Every science inquires into certain starting-points and causes for each of the things of which it is the science—for example, medicine and athletic training and each of the rest of the sciences whether productive or mathematical. For each of these marks off a certain genus and busies itself with it, as something that exists and is a being, although not qua being, since the science that does *this* is another science that is beyond the former ones. And each of the sciences just mentioned

5 somehow gets hold of the what-it-is in each genus and tries to show the rest in a weaker or more exact way. Some get hold of the what-it-is through perception, others by hypothesizing it. Hence it is clear from an induction of this sort that there is no demonstration of substance or the what-it-is.

10 However, since there is a science concerned with nature, it is clear that it must be distinct both from practical and from productive science. For in the case of productive science the starting-point of movement is in the producer and not in the product, and is either a craft or some other sort of capacity.<sup>1205</sup> Similarly, in practical science too the movement is not in the action done but in the doer of the action.<sup>1206</sup> But the natural scientist is concerned with things that have within themselves a starting-point of movement. It is clear from these considerations, therefore, that natural science is neither practical nor productive but theoretical, since it must fall in some one of these kinds (*genos*). And since each of the sciences must somehow know the what-it-is and use it as a starting-point, we must not fail to notice the way the natural scientist must define things and the way he must get hold of the account of the substance—whether like snub or like concave. For of these the account of the snub is said together with the matter of the thing, whereas that of the concave is said separate from the matter.<sup>1207</sup> For it is in a nose that the snubness occurs, which is why the account of it is theoretically grasped together with this. For the snub is concave nose. It is evident, then, that the account of flesh, too, and of the eye and of the other parts must always be given together with the matter.

30 Since, though, there is a science of being qua being and separable, we must investigate whether this should be posited as the same as natural science or rather as distinct from it. Natural science is concerned with things that have a starting-point of movement within themselves. Mathematics on the other hand is theoretical and is a science of things that remain the same but are not separable. Concerning things that are separable, therefore, and immovable, there is a science distinct from both of these—if indeed there is some substance of that sort (I mean separable and immovable), which is just what we shall try to show.<sup>1208</sup> And if indeed there is a nature of this sort among beings, there is where the divine, too, would surely be, and this would be the primary and most controlling starting-point.<sup>1209</sup> Accordingly, it is clear that there are three kinds (*genos*) of theoretical sciences—natural, mathematical, and theological.<sup>1210</sup> The best kind (*genos*) of science is that of the theoretical sciences, and of these themselves the last named one. For it is concerned with the most estimable of beings, and each science is said

to be better or worse in accord with the scientifically knowable object that properly belongs to it.<sup>1211</sup>

We might raise a puzzle, however, as to whether or not the science of being qua being should be posited as universal at all.<sup>1212</sup> For each of the mathematical sciences is concerned with some one definite genus, whereas universal mathematics is common, concerned with all alike.<sup>1213</sup> If, then, the natural substances are primary among beings, natural science will also be primary among the sciences, but if there is another nature and substance, separable and immovable, the science of it must be distinct from and prior to natural science, and universal by being prior.

### K 8

Since there are several ways in which something is said to unconditionally be, of which one is being said to be coincidentally, we must first investigate what it is to be in this way. Now, that none of the traditional sciences busies itself with the coincidental is clear. For building does not investigate what coincidentally happens to those who will use the house (for example, whether they will live painfully in it or in the contrary way), and weaving, or shoemaking, or gourmet cooking does not [investigate such things] either.<sup>1214</sup> Instead, each of these sciences investigates what is intrinsically special to it, and this is the end that properly belongs to it. And as for the argument that when the person who is musical becomes grammatical he will become both at the same time, not having been both before, and that what is, not always having been, must have come to be, so that he must at the same time have become musical and grammatical—that none of the agreed upon sciences inquires into except sophistic.<sup>1215</sup> For it alone busies itself with the coincidental—which is why Plato was not wrong when he used to say that the sophist spends his time on what is not.<sup>1216</sup>

But that is not even *possible* for there to be a science of the coincidental will be evident if we try to see what the coincidental really is.<sup>1217</sup> We say, then, that everything either is always and of necessity (not in the sense in which we say that something is forced but in the one we use in connection with demonstrations), or is for the most part, or is neither for the most part nor always and of necessity, but as-luck-would-have-it. For example, there might be cold weather in the dog-days, but this occurs neither always and of necessity nor for the most part, but it might occur sometimes. The coincidental, then, is what occurs, but neither always nor of necessity nor for the most

part. Well, now that we have stated what the coincidental is, it is clear why there is no science of such a thing. For every science is of what always or for the most part is, but what is coincidental is included in neither of these.

And that there are not causes and starting-points of the coincidental of the same sort as there are of the intrinsic is clear.<sup>1218</sup> For if there were, everything would be of necessity. For if A is when B is, and B is when C is, and if C is, not as-luck-would-have-it, but of necessity, what C was cause of will be of necessity, down to the last thing that is said to be caused (but this was supposed to be coincidentally). So all things will be of necessity, and both what occurs as-luck-would-have-it and what admits of coming to be and of not doing so will be entirely eliminated from the things that come to be. And if we suppose the cause not to exist already but to be coming to be, the same results will follow, since everything will come to be of necessity. For tomorrow's eclipse will occur if A occurs, and A if B occurs, and B if C occurs. And in this way if we keep on subtracting time from the finite time between now and tomorrow we shall come sometime to what already exists, so that since this exists, everything after it will occur of necessity, so that all things occur of necessity.

As for being as being true and being coincidentally, the former depends on a combination in thought and is an attribute of thought (which is why the starting-points of this way of being are not inquired about, but about being that is external and separable), whereas the latter is not necessary but indefinite (I mean, the coincidental), and of something like that the causes are unordered and unlimited.<sup>1219</sup>

The for-the-sake-of is found in things that come about by nature or as a result of thought.<sup>1220</sup> It is luck when one of these things comes about coincidentally. For just as being is either intrinsic or coincidental, in the same ways it is possible to be a cause. Luck is a coincidental cause in things that come about in accord with deliberate choice for the sake of an end, which is why luck and deliberate choice are concerned with the same things, for deliberate choice does not exist separate from thought.<sup>1221</sup> The causes, though, from which things due to luck might come about are indefinite, which is why luck is unclear to human rational calculation and a cause coincidentally, and is not unconditionally a cause of anything.<sup>1222</sup> It is good or bad luck when the result is good or bad, and is good or bad fortune when these are of a certain magnitude.<sup>1223</sup>

Since nothing coincidental is prior to the intrinsic, coincidental causes are not either.<sup>1224</sup> If, then, luck or chance is a cause of the heaven, understanding and nature are prior causes to it.<sup>1225</sup>

## K 9

Some things are actively only, some potentially, some potentially and actively—in one case being a this something, in another a quantity, or one of the rest.<sup>1226</sup> There is no movement, though, beyond the things [that are being moved], since change is always in accord with the categories of being, and there is nothing that is common to these and in no one category. But each of the categories belongs to all its members in two ways. For example, the this—one is the shape, the other its lack; as regards quality—one is white, the other black; as regards quantity—one is complete, the other incomplete; and as regards spatial movement—one is up, the other down, or one is [of what is] light, the other [of what is] heavy. And so there are as many kinds (*eidōs*) of movement and change as there are of being.<sup>1227</sup>

Since there is a division in each kind (*genos*) between what is potential and what is actual, the activation of what is potential, insofar as it is such, is what I say MOVEMENT is.<sup>1228</sup> And that what we say is true is clear from the following. For when the buildable, insofar as it is what we say it is, is active, it is being built, and this is building. Similarly with learning, curing, walking, leaping, aging, and ripening. Movement exists when the actuality itself does, and neither earlier nor later.<sup>1229</sup> The actualization, then, of what is potential, when it is actively actual, not insofar as it is itself but insofar as it is movable, is movement. By “insofar as,” I mean this: The bronze is indeed potentially a statue, but nonetheless it is not the actualization of the bronze insofar as it is bronze that is movement. For being for bronze is not the same as being for a certain potential, since if it were unconditionally the same in account, the actualization of the bronze would be a sort of movement.<sup>1230</sup> But it is not the same. (This is clear in the case of contraries. For to have the potentiality to be well and to have the potential to be sick are not the same, since if they were, to be well and to be sick would be the same. The underlying subject, though, whether it is healthy or diseased, whether it is moisture or blood, is one and the same.<sup>1231</sup>) And since it is not the same, just as color and the visible are not the same either, it is of the potential *insofar as it is potential* that the actuality is movement.

It is clear, then, that movement is this, and that it exists when the actuality itself does, and neither earlier nor later. For each thing [of this sort] admits of sometimes being active, sometimes not—for example, the buildable insofar as it is buildable. And the activation of the buildable insofar as it is buildable is building. For the activity is either this—the building—or the house. But when the house exists it is no longer buildable: what is buildable is what is *being built*. It is

5 necessary, therefore, for building to be the activity, and building is a sort of movement. And the same account also applies in the case of the other movements.

10 It is clear from what others say about movement that what we have stated is correct, and from the fact that it is not easy to define it otherwise. For we cannot put it in some other kind (*genos*). This is clear from what people say. For some say that it is otherness or inequality or not being, none of which is necessarily being moved, and nor is change to these or from these any more than to or from their opposites.<sup>1232</sup> What causes people to posit it as these is that movement seems to be something indefinite, and the starting-points in one of the two columns of opposites, because they are lacks, are indefinite.<sup>1233</sup> For none of them is either a this or a such-and-such sort or any of the rest of the categories. The cause of movement's seeming to be indefinite, though, is that it cannot be posited either as a potentiality of beings or as an activation of them. For neither what is potentially of a certain quantity nor what is actively of a certain quantity is of necessity moved, and while movement does seem to be a sort of activity, it is incomplete activity. But the cause of this is that the potentiality of which it is the activation is incomplete.<sup>1234</sup> And because of this it is difficult to grasp what movement is, since it must be posited either as a lack or as a potentiality or as an activity that is unconditionally such. But evidently none of these is possible. And so the remaining option is that it must be what we said, both an activity and not an activity in the way stated, which, though difficult to visualize, can exist.

20 And that movement in the movable is clear, since movement is the actualization of the movable by what can move something.<sup>1235</sup> And the activation of what can move something is no other. For there must be the actualization of both, since it *can move* something by having the potentiality to do so, and it *is moving* it by being active. But it is on the movable that the mover is capable of acting, so that the activation of both alike is one, just as the intervals from one to two and from two to one are the same, or as are the hill up and the hill down, although the being for them is not one. And similarly in the case of the mover and the moved.

### K 10

35 The UNLIMITED is either what cannot be traversed because it is by its nature not to be traversed (in just the way the voice is invisible), or what admits only of incomplete traverse, or scarcely admits of it, or



what—though by its nature it admits of traverse or limit—is not traversed or limited. Further, something may be unlimited with respect to addition, to subtraction, or both.<sup>1236</sup> On the other hand, a separable thing is something the unlimited certainly cannot be. For if it is neither a magnitude nor a plurality, but the unlimited itself is substance and not a coincident, it will be indivisible, since the divisible is either magnitude or plurality. But if it is indivisible, it is not unlimited, except in the way that the voice is invisible. This, though, is not the way people use the term nor are we inquiring into it but into the unlimited as untraversable.

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Further, how is it possible for the unlimited to intrinsically exist, if number and magnitude, of which the unlimited is an attribute, do not?<sup>1237</sup> Further, if the unlimited is a coincident, it cannot—insofar as it is unlimited—be an element of beings, just as the invisible is not an element of speech, even though the voice is invisible.<sup>1238</sup> Also, it is clear that it is not possible for the unlimited to be actively so.<sup>1239</sup> For then any part of it that might be taken would be unlimited (for being for the unlimited and the unlimited are the same, if indeed the unlimited is a substance and not an attribute of an underlying subject).<sup>1240</sup> Hence it is either indivisible or—if it is capable of having parts—is divisible into unlimiteds. But the same thing cannot be many unlimiteds (for just as air is part of air, so would unlimited be of unlimited, if the unlimited is substance and starting-point). Therefore, it must be incapable of having parts and indivisible. What is actively unlimited, however, cannot be indivisible, since it must be a certain quantity. Therefore, it must belong as a coincident does. But if so, then (as we have said) it cannot be *it* that is a starting-point, but rather that thing with which it is coincident, namely, the air or the even.<sup>1241</sup>

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Now, the preceding inquiry is universal—but that the unlimited is not found in perceptible things either will be clear from what follows.<sup>1242</sup> For if the account of body is “what is bounded by planes,” there cannot be any unlimited body, whether perceptible or intelligible, nor can there be a number considered as separate and unlimited, since a number or what has a number is numerable.

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In the context of natural science, this is clear from the following considerations.<sup>1243</sup> For the unlimited can neither be [1] composite nor [2] simple. [1] For it cannot be a composite body if the elements are limited in multiplicity.<sup>1244</sup> For the contraries must be equalized and no one of them must be unlimited, since if one of the two bodies falls in any way short of the other in capacity, the limited one will be destroyed by the unlimited one.<sup>1245</sup> And that each should be unlimited

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is impossible. For body is what has extension in all directions, and the unlimited is the limitlessly extended, so that if the unlimited is a body, it will be unlimited in all directions.

[2a] Nor can the unlimited body be one and simple, whether, as some people say, it is something beyond the elements, out of which they generate these (for there is no such body beyond the elements, since everything can be resolved into what is composed of, but evidently not into things beyond the simple bodies), or it is fire or any of the other elements.<sup>1246</sup> For apart from the question of how any of them could be unlimited, the universe, even if it is limited, cannot be or become any one of them—as Heraclitus says all things at times become fire.<sup>1247</sup> The same argument applies also to the one that the physicists put beyond the elements.<sup>1248</sup> For everything changes from contrary to contrary—for example, from hot to cold.

Further, a perceptible body is somewhere, and the [proper] place of the whole and of the part is the same, as in the case of the earth.<sup>1249</sup> [2b] Hence if the unlimited body is uniform, it will be immovable or will always be moving. But this is impossible. For why down rather than up or than anywhere else?<sup>1250</sup> For example, if there is a clod of earth, where will this move or be at rest? For the proper place of the body that is homogeneous with it is unlimited. Will the clod occupy the whole place, then? And, how? What then of its rest or movement? Will it be resting everywhere? In which case it cannot move. Or be moving everywhere? In which case it cannot rest.

On the other hand, if the universe has unlike parts, their proper places will also be unlike, and, first, the body of the universe will not be one except by contact, and, second, the parts will be either limited or unlimited in kind (*eidos*).<sup>1251</sup> But limited they cannot be, since then those of one kind will be unlimited and those of another will not (if the universe is unlimited)—for example, fire or water will be unlimited, but something like that will be destructive of their contraries.<sup>1252</sup> But if the parts are unlimited and simple, their places are also unlimited, and there will be an unlimited number of elements.<sup>1253</sup> But if this is impossible and the places are limited, the universe must be limited too.<sup>1254</sup>

In general, then, there can be neither an unlimited body nor an unlimited [proper] place for bodies, if every perceptible body has either weight or lightness.<sup>1255</sup> For it must move either toward the middle or upward, and the unlimited—either the whole or the half—cannot do either, since how can you divide it? Or how will part of the unlimited be down and part up, or part extreme and part middle? Further, every perceptible body is in a place, and there are six kinds (*eidos*) of place,

but these cannot exist in an unlimited body.<sup>1256</sup> In general, if an unlimited place is impossible, so is an unlimited body. [And the former is impossible.] For what is in a place is somewhere, and this signifies either up or down or in one of the other directions, and each of these is a sort of limit.<sup>1257</sup>

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The unlimited is not the same thing in magnitude, in movement, and in time in the way that some one nature is, rather, the posterior among these is said to be unlimited with reference to the prior—as, for example, a movement is said to be unlimited with reference to the magnitude of the distance covered by an object's movement, alteration, or growth, and a time is with reference to the movement that occupies it.<sup>1258</sup>

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## K 11

Of things that change, some change coincidentally, as when the musical walks, and other are unconditionally said to change, because something in them changes—for example, in respect of their parts (for the body becomes healthy, because the eye does), and there is also something that is itself moved directly, and this is the intrinsically movable.<sup>1259</sup> It is the same way in the case of the mover. For it moves something either coincidentally or in respect of a part of itself or intrinsically. But there is something that directly moves a thing. And there is something that is moved, also the time during which it is moved, and that from which and that to which it is moved. The forms, though, and the attributes and the places to which moving things are moved are immovable—for example, scientific knowledge and heat (and it is not heat that is a movement but heating).<sup>1260</sup>

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Now, change that is not coincidental is not found in all things but only in contraries, intermediates, and in contradictories.<sup>1261</sup> We may be convinced of this by induction. Something that changes changes either from an underlying subject to an underlying subject, or from what is not an underlying subject to what is not an underlying subject, or from an underlying subject to what is not an underlying subject, or from what is not an underlying subject to an underlying subject (I mean by "underlying subject" what is made clear by an affirmation), so that there must be three sorts of changes.<sup>1262</sup> For there is no change from what is not an underlying subject to what is not an underlying subject, because (since neither are the terms contraries nor is there any contradiction) there is no opposition.

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A change from what is not an underlying subject to an underlying subject, the relation being that of contradiction, is a coming to

be—an unconditional coming to be when the change is unconditional, in a particular respect when the change is in a particular respect.<sup>1263</sup> A change from an underlying subject to what is not an underlying subject is a passing away—an unconditional passing away when the change is unconditional, in a particular respect when the change is in a particular respect.

Now, if things are said not to be in many ways, and neither what is not by combination or by division nor what potentially is not and is opposed to what unconditionally is admits of movement (for what is not white or not good can still coincidentally admit of movement, since the not white could be human, whereas what is unconditionally not a this can in no way admit of movement), what is not cannot be moved.<sup>1264</sup>

And if this is so, coming to be cannot be a movement either, since what is not does come to be. For even if the coming to be is in the highest degree coincidental, still it is true to say that not being belongs to what is unconditionally coming to be. For similar reasons, what is not cannot be at rest. These difficulties follow, then, as does this one, namely, that if everything that is moved is in a place, and what is not is not in a place, [it cannot move], since if it did it would be somewhere. Passing away is not a movement either, then. For the contrary of a movement is either another movement or rest, whereas the contrary of passing away is coming to be.

And since every movement is a sort of change, and the sorts of changes are the three aforementioned ones, and of these the ones with respect to coming to be and passing away are not movements, and they are the changes that involve a relation of contradiction, it necessarily follows that only the one from an underlying subject to an underlying subject is movement. The underlying subjects, though, may be either contraries or intermediates (for a lack must also be regarded as a contrary), and are made clear by an affirmation—for example, the naked, toothless, or black.<sup>1265</sup>

## K 12

If the categories are distinguished as substance, quality, place, acting or being acted upon, relation, quantity, there must be three movements—of quality, of quantity, of place.<sup>1266</sup> There is no movement with respect to substance (because there is nothing contrary to substance), nor of relation (for when one of the two relata changes it may not be true that the other changes at all, so that the movement of them is coincidental), nor of agent and acted upon or mover and moved, because there is

no movement of movement nor coming to be of coming to be, nor, in general, change of change.<sup>1267</sup>

There are two ways, though, in which there *might* be movement of movement: [1] As an underlying subject (for example, as a human is moved because he changes from pale to dark), so that in this way movement, too, may be either heated or cooled or change its place or increase in size. But this is impossible, since a change is not a sort of underlying subject. Or [2] some other underlying subject might change from one change to some other kind (*eidos*)—for example, the human from sickness to health.<sup>1268</sup> But this is not possible either, except coincidentally. For every change is from something to something. Coming to be and passing way are also like that, except that they are to things opposed in one way, whereas the other—movement—is to things opposed in another way.<sup>1269</sup> Hence a thing changes at the same time from health to sickness, and from this change itself to another. It is clear, then, that if it has become sick, it will have changed to whatever the other sort of change may be (since it may remain at rest), and furthermore never to some random sort.<sup>1270</sup> And this new change will be from something to something else, so that this will be the opposite change, namely, becoming healthy. But [we will respond], this is by coincidence, as there is change from recollecting to forgetting, because that to which these belong changes, now toward scientific knowledge, now toward ignorance.

Further, it will go on without limit, if there is to be change of a change and coming to be of a coming to be. If this is so later, then, it must also be so earlier. For example, if the simple coming to be was at some time coming to be, what comes to be something was also at some time coming to be. So what simply comes to be something was not yet there, but there was already something that was coming to be coming to be something.<sup>1271</sup> And *this* was at some time itself coming to be, and so it was not yet at that time coming to be something else. But since in an unlimited series there is no first term, there will be no first here either, and so neither will there be a following one. Nothing, then, can either come to be or move or change.

Further, the same thing that admits of movement also admits of the contrary movement (and of resting), and of coming to be and passing away. So what is coming to be is passing away when it has come to be coming to be. For it cannot pass away as soon as it is coming to be coming to be something, nor after it has come to be, since what is passing away must *be*. Further, there must be a matter that underlies what comes to be and changes. What then will it be? What is it that becomes a movement or a coming to be, as a body or a soul is what

undergoes alteration? And, further, *to what* do they move? For what it must be the movement or coming to be of is something from something to something. But how can it be? For the process of learning is not *of* the process of learning, and so no coming to be is of coming to be, either.

15 Since there is no movement either of substance or of relation or of acting and being acted upon, it remains for movement to be with respect to quality, quantity, and place.<sup>1272</sup> For each of these admits of contrariety. By quality I mean not what is in the substance (for even the differentia is a quality), but the affective quality in virtue of which a thing is said to be acted upon or to be incapable of being acted upon.

20 The IMMOVABLE, however, is either what is wholly incapable of being moved; or is moved scarcely at all in a long time or is slow in starting to be moved; or what is naturally moved and is capable of being so but is not moved either when, where, or how in accord with its nature it should be moved.<sup>1273</sup> Of the immovables, the last is the only one I describe as being at rest. For rest is contrary to movement, so that it must be a lack in what is receptive of movement.

25 What are TOGETHER IN PLACE are things they are in one primary place, and what are SEPARATE are things that are in distinct primary places.<sup>1274</sup> Things are MAKING CONTACT [or TOUCHING] when their extremes are together in place. An INTERMEDIATE is what a changing thing—if it changes continuously—arrives at prior to arriving at the ultimate thing to which, in accord with its nature, it is changing. What are CONTRARY IN PLACE are what are most distant in a straight line.<sup>1275</sup> What is SUCCESSIVE is what is after the starting-point (the order being determined by position or form or in some other way) and has nothing of the same kind (*genos*) between it and what it succeeds—for example, lines in the case of line, units in that of unit, or houses in that of house (but there is nothing to prevent something of some other kind from being in between). For what is successive is successive of something and is something posterior. For one does not succeed two, nor the first day of the month the second. What are CONTIGUOUS are what are successive and making contact. (Since all change is between opposites, and these are either contraries or contradictories, and there is no middle term between contradictories, clearly what is intermediate is between contraries.<sup>1276</sup>) CONTINUITY is just a sort of contiguity. I mean that two things are continuous when the limits of each, by which they make contact and by which they are kept together, become one and the same. So it is clear that the continuous is found in those things that by nature become one in virtue of their making contact. It is also clear

that the successive is primary.<sup>1277</sup> For things that are successive do not [necessarily] make contact, but things that make contact are successive; and if things are continuous, they make contact, but if they make contact, they are not necessarily continuous; and in things in which there is no contact, there is no natural unity. So a point is not the same as a unit, since in points there is contact, whereas in units there is not, but only succession; and whereas between points there is something intermediate, between units there is not.<sup>1278</sup>

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## BOOK LAMBDA (XII)

## A 1

The theoretical knowledge [we are seeking] is concerned with substance.<sup>1279</sup> For it is the starting-points and the causes of substances that are being inquired about. For if in fact the universe is a whole of some sort, substance is its primary part, and if it exists by being a succession, in this way, too, substance is primary, then quality, then quantity.<sup>1280</sup> At the same time, these latter things are not (one might almost say) unconditionally beings but qualities and movements—or else even the not-white and the not-straight will be beings (at any rate, we say that even these things *are*—for example, that something *is* not-white).<sup>1281</sup> Further, none of the others is separable.<sup>1282</sup>

The early philosophers also in effect testify to this, since they were inquiring into the starting-points, elements, and causes of substance.<sup>1283</sup> Present-day thinkers, to be sure, posit the universals as substances to a higher degree (for the genera are universal, and these they say are starting-points and substances to a higher degree, because they inquire in a logico-linguistic way).<sup>1284</sup> The thinkers of olden days, by contrast, [posit] the particulars, such as, fire and earth, [as substances to a higher degree] but not what is common to both, namely, [being a] body.<sup>1285</sup>

There are, though, three sorts of substances. One is perceptible, of which [1] one sort is capable of passing away, such as plants and animals, and [2] the other sort eternal—of which it is necessary to grasp the elements, whether one or many.<sup>1286</sup> And [3] another sort that is immovable, and this [3a] certain thinkers say is separable, some dividing it into two, the Forms and the objects of mathematics, [3b] others positing these two as one in nature, and [3c] others only one of these, namely, the objects of mathematics.<sup>1287</sup> The first two sorts belong to natural science (for they involve movement), but the third to another science, if no starting-point is common to these.<sup>1288</sup>

Now, perceptible substance is changeable. But if change is from opposites or from intermediates, and not from all opposites—since the voice is not white [but does not change to white]—but from the contrary one, there must be something underlying that changes to the contrary state, since the contraries do not change.<sup>1289</sup>



A 2<sup>1290</sup>

Further, something remains [throughout the change], but the contrary does not remain. There is, therefore, some third thing beyond the contraries, namely, the matter. If, then, changes are of four sorts, either with respect to the [this] something, or with respect to the quality, quantity, or place, and if unconditional coming to be and passing away are with respect to the this, growth and withering with respect to quantity, alteration with respect to an affection, spatial movement with respect to place, then changes would in each case be to the corresponding contrary states.<sup>1291</sup> It must, then, be the matter, since it is capable of both states, that changes.<sup>1292</sup>

But since being is twofold, everything changes from what is potentially to what is actively—for example, from what is potentially white to what is actively white, and similarly in the case of growth and withering. So not only is it coincidentally possible for something to come to be from what is not, but in fact for all things to come to be from what is—from what is *potentially*, however, but from what *actually* is not. And this is “the one” of Anaxagoras (for this is better than “all things were together”), and the “mixture” of Empedocles and Anaximander, and what Democritus says, namely, “all things were together”—potentially, yes, but not actively.<sup>1293</sup> So these thinkers could be latching on to matter.

All things that change have matter, however, but of distinct sorts.<sup>1294</sup> And of eternal things those that do not admit of coming to be but do admit of spatial movement have matter—not matter for coming to be, however, but for movement from where to where.

Someone might raise a puzzle, though, about what sort of not being coming to be is from. For not being is trifold.<sup>1295</sup> If, then, there is something that is potentially something, nonetheless it is not potentially any random thing, but rather distinct things come from distinct things. Nor is it enough to say “all things were together,” for they differ in their matter, since otherwise why did an unlimited number of things come to be and not one? For the understanding is one, so that if the matter was also one, that thing would have come to be actively which the matter was potentially. The causes, then, are three, and the starting-points three, two of them are the contraries, of which one is the account and the form and the other the lack, and the third the matter.

## A 3

Next, note that neither the matter nor the form comes to be—I mean the ultimate ones.<sup>1296</sup> For everything that changes is something, and

changes as a result of something, to something. That as a result of which is the direct mover; what changes is the matter; what it changes to, the form.<sup>1297</sup> So the process will go on without limit, if not only the bronze becomes round, but the round or the bronze come to be as well. There must, then, be a stopping point.

Next, note that each substance comes to be from something with the same name (the substances that are by nature, indeed, and the others). For things come to be either by craft, by nature, by luck, or by chance.<sup>1298</sup> Now craft is a starting-point that is in another thing, whereas nature is a starting-point in the thing itself (for human begets human), and the remaining causes are lacks of these.<sup>1299</sup>

There are, though, three sorts of substances: [1] the matter, which is a this something [merely] in appearance (for whatever is by contact and not by natural unity is matter and underlying subject, for example, fire, flesh, head, since these are all matter, and the final matter is that of what is most of all substance); [2] the nature, which is a this something and a certain state toward which; and furthermore, third, [3] the one composed of these, which is a particular, such as Socrates or Callias.<sup>1300</sup> Now in some cases the this something is not beyond the composite substance (for example, the form of house is not, unless as the craft of building, nor is there coming to be or passing away of these, but instead it is in another way that there is or is not a house that is without matter, or health, or anything that is in accord with craft), but if indeed it is so in any, it is in the case of the ones that are by nature.<sup>1301</sup> Which is why Plato was not far wrong in saying that there are as many Forms as there are sorts of things that are by nature—if indeed there *are* Forms that are not belonging to the things [that exist here].

The moving causes are causes in the way preexisting things are, whereas those that are causes in the way that the account is exist at the same time as what they cause.<sup>1302</sup> For it is when the human is healthy that at the same time too the health is there, and the shape of a sphere of bronze is there at the same time as the brazen sphere. (But whether any form remains also afterward must be investigated. For in some cases there is nothing to prevent this. For example, the soul may be like this—not all soul, but rather the understanding.<sup>1303</sup> For that all of it should be so is presumably impossible.)

It is evident, then, that there is no necessity—because of these considerations, at any rate—for there to be the Ideas. For human begets human, the particular one begetting the particular one. And similarly in case of the crafts. For the craft of medicine is the account of health.

## A 4

The causes and starting-points of distinct things are distinct in a way, but in a way—if we are to speak universally and analogically—they are the same for all.<sup>1304</sup> For we might raise a puzzle as to whether the starting-points and elements of substances and of relations are distinct or the same, and similarly, then, in the case of each of the categories. But it would be absurd if they were the same for all. For relations and substances would then both come from the same ones. What, then, will these be? For beyond substance and the other categories of predicables there is nothing common, but an element is prior to the things of which it is an element.<sup>1305</sup> But then substance is not an element of relations either, nor is any of these an element of substance. Further, how can all things possibly have the same elements? For none of the elements can be the same as the thing that is composed of elements—for example, BA as A or B. (Nor, then, is any of the intelligible things an element—for example, being or the one. For they belong to each of the composite things as well.<sup>1306</sup>) None of the elements, then, will be either a substance or a relation—but this is necessary.<sup>1307</sup> Nor, then, do all things have the same elements.

Or as we say, there is a way in which they do and there is a way in which they do not. For example, the elements of perceptible bodies are presumably: as *form*, the hot and, in another way, the cold, which is the *lack*; and, as *matter*, what is potentially these directly and intrinsically.<sup>1308</sup> And both these and the things composed of them are substances, of which these are the starting-points (that is, anything that comes to be from the hot and the cold that is one [something-or-other], such as flesh or bone), since what comes to be from these must be distinct from them. These things, then, have the same elements and starting-points (although distinct things have distinct ones). But that all things have the same ones is not something we can say just like that, although *by analogy* they do. That is, we might say that there are three starting-points—the form, the lack, and the matter. But each of these is distinct for each category (*genos*)—for example, in colors they are white, black, and surface, or light, darkness, and air, out of which day and night come to be.<sup>1309</sup>

But since not only the things present in something are causes, but also certain external things, for example, the moving cause, it is clear that starting-point and element are distinct. Both, though, are causes, while what is so in the sense of moving or causing rest is a sort of starting-point, and the starting-point is divided into these two [sorts].<sup>1310</sup> So analogically there are three elements, and four causes and starting-points. But distinct things have distinct ones, as was said,

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and the direct cause in the sense of a moving cause is distinct for distinct things.<sup>1311</sup> Health, sickness, body—the moving cause is the craft of medicine. Form, disorder of such-and-such sort, bricks—the moving cause is the craft of building. And since the moving cause in the case of natural things is for a human a human, and in those that come from thought it is the form or its contrary, there will be in a way three causes, while in a way there are four.<sup>1312</sup> For the craft of medicine is in a way health, and the craft of building is form of a house, and human begets human; and, furthermore, beyond these there is what as the first of all [movers] moves all things.<sup>1313</sup>

## A 5

But since some things are separable and others are not separable, the former are substances.<sup>1314</sup> And because of this the same things are causes of all things, because, without substances, there are no attributes or movements. Next, these causes will presumably be soul and body, or understanding, desire, and body.<sup>1315</sup>

Further, there is another way in which the causes are analogically the same, namely, activity and potentiality.<sup>1316</sup> But these too are not only distinct for distinct things but also apply to them in distinct ways. For in some cases the same thing is sometimes active and sometimes potential—for example, wine or flesh or human.<sup>1317</sup> But these also fall under the aforementioned causes.<sup>1318</sup> For the form *actively* is, if it is separable; as is what is composed of both [matter and form]; as is the lack—for example, darkness or sickness; the matter, on the other hand, *potentially* is, since it is what is capable of becoming both.<sup>1319</sup> But active and potential differ in another way in the case of things whose matter is not the same, of which the form is not the same but distinct—just as, for example, the cause of a human is both his elements, fire and earth as matter and the special form [as form], and furthermore some other external thing, such as the father, and beyond these the sun and its movement in an inclined circle, which are not matter, form, or lack, and are not the same in form [as father or son], but are, rather, movers.<sup>1320</sup>

Further, it must be observed that some causes can be stated in universal terms, whereas others cannot. The this that is first active, then, and a distinct thing that is potential, are the starting-points of all things. Well, these are not universals, since the particular is the starting-point of the particulars. For while human is the starting-point of human universally, no particular human is—instead, Peleus is of Achilles, and your father of you, and this B of this BA, and B in general of BA unconditionally.

Next, the causes and elements of substances (but distinct ones of distinct ones) are already, as has been said, the causes and elements of things that are not in the same kind (*genos*)—of colors, sounds, substances, quantity—save by analogy.<sup>1321</sup> And those of things in the same species are distinct, not in species but because the causes of the particular ones—your matter and form and moving cause and mine—are distinct, but in universal account they are the same.

When we inquire, then, about the starting-points or elements of substances, relations, and qualities, as to whether they are the same or distinct, it is clear that when they are said of things *in many ways* they are the same, but when these are distinguished the starting-points and elements are not the same but distinct—except that in a way the causes of all are the same. And in one way they are the same or analogous because matter, form, lack, and moving cause are omnipresent; in another way the causes of substances may be considered as the causes of all things, because if substances are done away with, all things are done away with; furthermore, the first in terms of actuality is a cause of all things.<sup>1322</sup> In another way, though, there are distinct direct causes, namely, the contraries that are said of things neither as genera nor in many ways, and furthermore the matters.<sup>1323</sup>

What the starting-points of perceptible things are, how many they are, and in what way they are the same and in what way distinct, has now been stated.

## A 6

Since there were three sorts of substances, two of them natural and one immovable, concerning the latter it must be said that it is necessary for there to be an eternal immovable substance.<sup>1324</sup> For substances are primary among beings, and if they are all capable of passing away, everything is capable of passing away. But it is impossible that movement either came into being or passed away (for at every point it was), or that time did, since there cannot be a before and an after if there is no time.<sup>1325</sup> Movement too is continuous, then, in the way that time also is, since time is either the same thing as movement or an attribute of it.<sup>1326</sup> But there is no continuous movement except movement in place, and of this only that which is circular is continuous.<sup>1327</sup>

But then if there is something that is capable of moving things or acting on them, but that is not actively doing so, there will not [necessarily] be movement, since it is possible for what has a capacity not to activate it.<sup>1328</sup> There is no benefit, therefore, in positing eternal substances, as those who accept the Forms do, unless there is to be

15 present in them some starting-point that is capable of causing change. Moreover, even this is not enough, and neither is another substance beyond the Forms.<sup>1329</sup> For if it will not be active, there will not be movement. Further, even if it will be active, it is not enough, if the substance of it is a capacity. For then there will not be *eternal* movement, since what is potential may possibly not be. There must, therefore, be such a starting-point, the substance of which is activity.<sup>1330</sup>  
 20 Further, accordingly, these substances must be without matter.<sup>1331</sup> For they must be eternal, if indeed anything else is eternal. Therefore they must be activity.

And yet there is a puzzle. For it seems that everything that is active is capable of being active, whereas not everything that is capable of being active is active, so that the capacity is prior. But then if this is so,  
 25 none of the beings will be. For it is possible to be capable of being and not yet be.

And yet if we follow the theologians who generate things from night, or the physicists who say that "all things were together," the same impossibility results.<sup>1332</sup> For how will anything be moved if there is not something that is actively a cause? For wood will surely not move itself,  
 30 but the craft of carpentry will, nor will the menstrual fluid or the earth move themselves, but the seeds and the semen will.<sup>1333</sup>

That is why some thinkers, such as Leucippus and Plato, posit eternal activity, since they say that there is always movement.<sup>1334</sup> But why and what it is they do not say, nor, if the movement is this way or that, what the cause is. For nothing is moved at random, but there must always be some particular sort present—just as, as things stand, a thing moves  
 35 in one way by nature and in another by force or as a result of understanding or of something else.<sup>1335</sup> Further, what sort of movement is primary?<sup>1336</sup> This makes an enormous difference. But again in the case of Plato, at any rate, it is not possible even to state what he sometimes thinks the starting-point is, namely, what moves itself, since the soul is later than and coeval with the heaven, according to his account.<sup>1337</sup>  
 1072<sup>a</sup> 1

To think, then, that capacity is prior to activity is in one way correct and in another way not—and it has been stated how.<sup>1338</sup> But that activity is prior is attested by Anaxagoras (for the [divine] understanding is an activity) and by Empedocles (love and strife), and by those  
 5 who say that there is always movement, as Leucippus does. So chaos or night did not exist for an unlimited time, rather, the same things existed always (either passing through a cycle of changes or in some other way), if indeed activity is prior to capacity.

If, then, there is a constant cycle, something [A] must always remain,  
 10 acting in the same way. And if there is to be coming to be and passing

away, there must be something else [B] that is always acting now in one way now in another.<sup>1339</sup> This [B] must, therefore, act in one way intrinsically and in another in virtue of something else—either of a third thing [C], therefore, or of the first [A]. It must, then, be in virtue of this one [A]. For otherwise this [A] again causes the movement of that one [C] and of the other one [B]. Accordingly, it is better to say “the first” [A].<sup>1340</sup> For it was the cause of things always occurring in the same way, and something else the cause of their occurring in another way, and of their always occurring in another way clearly both are the cause. This, therefore, is the way the movements actually take place.<sup>1341</sup> Why, then, inquire after other starting-points?<sup>1342</sup>

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## A 7

Since it is possible that things are this way, and if they are not this way, they would have come from night, or all things together, or from not being, these issues may be taken as resolved.<sup>1343</sup> And there is something that is always moved with an unceasing movement, which is in a circle (and this is clear not from argument alone but also from the facts).<sup>1344</sup> So the primary heaven would be eternal.<sup>1345</sup> There is, therefore, also something that moves it.<sup>1346</sup> But since what is moved and moves something is something medial, there is something that moves without being moved, being eternal, substance, and activity.<sup>1347</sup>

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This, though, is the way the object of desire and the intelligible object move things: they move them without being moved.<sup>1348</sup> Of these objects, the primary ones are the same.<sup>1349</sup> For the [primary] object of appetite is the apparently noble, and the primary object of wish is the really noble.<sup>1350</sup> But we desire something because it seems [noble] rather than its seeming so because we desire it. For the starting-point is the active understanding. And understanding is moved by intelligible objects, and what is intrinsically intelligible is the one column [of opposites], and in this substance is primary, and in *this* the simple one and an activity—oneness and simplicity are not the same, since unity signifies a measure, whereas simplicity signifies that the thing itself is a certain way.<sup>1351</sup> But the noble, too, and what is choiceworthy because of itself are in the same column, and what is primary is always best or analogous to the best.

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That the for-the-sake-of-which does exist among the immovable things is made clear by a distinction.<sup>1352</sup> For the for-the-sake-of-which is both the one *for whom* and *that toward which*, and of these the latter is among the immovable things and the former is not. And it produces

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movement insofar as it is loved, whereas it is by being moved that the other things move.<sup>1353</sup>

Now if something is moved, it admits of being otherwise than it is, so that if the primary spatial movement for its part is an activity, insofar as it is being moved, in this respect it admits of being otherwise—  
 5 with respect to place, even if not with respect to substance. But since there is something that moves while it itself is immovable, though it is in activity, it can in no way admit of being otherwise.<sup>1354</sup> For spatial movement is primary among the sorts of change, and of these, that in a circle is primary; and this it produces. Therefore, it [the prime mover] of necessity is; and insofar as it is of necessity, it is in noble fashion,  
 10 and in this way a starting-point [of movement]. For something is said to be necessary in a number of ways—as what is forced contrary to natural impulse, as that without which what is good does not exist, and as what does not admit of being otherwise, but is unconditionally necessary.<sup>1355</sup>

This, therefore, is the sort of starting-point on which the heaven and nature depend. And its pastime is like the best that we can have—  
 15 and have for a short time (for it is always in that state [of activity], whereas we cannot be)—since its activity is also pleasure.<sup>1356</sup> And it is because of this that waking, perceiving, and active understanding are a very great pleasure, and expectation and memory because of these. Active understanding, though, is intrinsically of what is intrinsically best, and the sort that is to the highest degree best is of what is to the highest degree best.<sup>1357</sup> And the understanding actively understands itself by partaking of the intelligible object. (For it becomes an intel-  
 20 ligible object by touching and understanding one, so that understanding and intelligible object are the same.<sup>1358</sup>) For what is receptive of the intelligible object and of the substance is the understanding, and it is active when it possesses it, so that this rather than that seems to be the divine thing that understanding possesses, and contemplation seems to be most pleasant and best.<sup>1359</sup> If, then, that good state [of activity], which we are sometimes in, the [primary] god is always in, that is a wonderful thing, and if to a higher degree, that is yet more wonderful.<sup>1360</sup> But that is his state. And life too certainly belongs to him.<sup>1361</sup> For the activity of understanding is life, and he is that activ-  
 25 ity; and his intrinsic activity is life that is best and eternal. We say, indeed, that the god is a living being who is eternal and best, so that living and a continuous and everlasting eternity belong to the god, since this is the god.<sup>1362</sup>

Those who take it, as the Pythagoreans and Speusippus do, that the noblest and best is not present in the starting-point, because, while the



starting-points of plants and animals are causes too, noble beauty and completeness are in what comes from these, are not correct in their thinking.<sup>1363</sup> For the seed comes from other things that are prior and complete, and the first thing is not seed but the complete thing, as we might say "the human is prior to the seed"—not the one who came to be from it but another one from whom the seed came.<sup>1364</sup> 35 1073<sup>a</sup>1

It is evident from what has been said, then, that there is a substance that is eternal and immovable and separate from perceptible things. And it has also been shown that this substance cannot have any magnitude, but must be without parts and indivisible.<sup>1365</sup> For it moves something for an unlimited time, and nothing finite has unlimited capacity. And, since every magnitude is either unlimited or finite, it cannot have a finite magnitude, because of what we said, and it cannot have an unlimited magnitude because there is no unlimited magnitude at all. But then it has also been shown that it is impassive and inalterable.<sup>1366</sup> For all the other movements are posterior to that with respect to place.<sup>1367</sup> 5 10

It is clear, then, why things are this way.

## A 8

We must not neglect to consider, though, whether we should posit one substance of this sort or several, and, if several, how many. On the other hand, we should remind ourselves too about the views of the others, namely, that they say nothing that can even be perspicuously stated about how many they are.<sup>1368</sup> For the doctrine of Ideas contains no special investigation of the topic. (For those who accept the Ideas say that the Ideas are numbers, and where numbers are concerned they sometimes speak as if, being defined up to ten, they were finite.<sup>1369</sup> But about the cause of there being this many numbers nothing is said with demonstrative seriousness.) We, however, must discuss the topic on the basis of the assumptions and determinations already made. 15 20

The starting-point and primary being is immovable both intrinsically and coincidentally, but it causes the primary eternal and single movement. But since what is moved must be moved by something, and the prime mover must be intrinsically immovable, and eternal movement must be caused by something eternal, and a single movement by a single thing, and since we see that beyond the simple spatial movement of the universe, which we say the primary and immovable substance causes, there are other spatial movements—those of the planets—that are eternal (for the body with a circular movement is 25 30

eternal and unresting, as has been shown in our works on natural science), each of *these* spatial movements must be caused by a substance that is both intrinsically immovable and eternal.<sup>1370</sup> For the nature of the stars is eternal, because it is a certain sort of substance, and the mover is eternal and prior to the moved, and what is prior to a substance must be a substance.<sup>1371</sup> It is evident, accordingly, that there must be this number of substances that are in their nature eternal and intrinsically immovable, and without magnitude (due to the cause mentioned earlier).<sup>1372</sup>

It is evident, then, that the movers are substances, and that one of these is first and another second, in accord with the same order as the spatial movements of the stars. But when we come to the number of these spatial movements, we must investigate it on the basis of the mathematical science that is most akin to philosophy, namely, astronomy. For it is about substance that is perceptible but eternal that this produces its theoretical knowledge, whereas the others are not concerned with any substance at all—for example, the one concerned with numbers and geometry.

Now that the spatial movements are more numerous than the bodies that are moved is evident to those with even a moderate grasp on the subject, since each of the planets has more than one spatial movement. But as to how many these are, we now—to give some notion of it—state what some of the mathematicians say, so that there be some definite number for our thought to grasp. For the rest, though, we must partly inquire for ourselves, partly learn from other inquirers, and if something contrary to what is now being said appears correct to those who are busying themselves with these issues, we should be amicable to both sides, but follow the more exact ones.

As for Eudoxus, he posited that the spatial movement of the sun and the moon in each case involves three spheres, of which the first is the sphere of the fixed stars, the second moves in the circle along the middle of the zodiac, and the third moves in the circle inclined across the breadth of the zodiac.<sup>1373</sup> The circle in which the moon moves, though, is inclined at a greater angle than that in which the sun is spatially moving. The spatial movement of the planets involves in each case four spheres, and of these the first and the second are the same as for the sun and the moon (for the sphere of the fixed stars is what moves all the other spheres, and the one that is placed beneath this and has its spatial movement in the circle along the middle of the zodiac is common to all the spheres). But the poles of the third sphere of each planet are in the circle along the middle of the zodiac, while the spatial movement of the fourth sphere is inclined at an

angle to the equator of the third one. Also the poles of third sphere are special to the various planets, but those of Venus and of Mercury are the same.

As for Callippus, he posited the same position of the spheres that Eudoxus posited, but while he assigned to Jupiter and Saturn the same number as Eudoxus did, he thought that two further spheres should be added to the sun and to the moon, if we are to account for the appearances, and one more to each of the other planets.<sup>1374</sup>

But if all the spheres combined are to account for the appearances, then for each of the planets there must be other spheres, but one fewer, which counteract the former, and in each case restore to the same position the first [or outermost] sphere of the star that is placed beneath the star in question.<sup>1375</sup> For only in this way is it possible for all the combined spheres to produce the spatial movements of the planets. So since the spheres in which the planets themselves are carried along are eight [for Jupiter and Saturn] and twenty-five [for the others], and of these, only those in which the lowest one is carried along does not need to be counteracted, the spheres that counteract those of the first [or outermost] two planets will be six, and those counteracting the spheres of the next four will be sixteen. The number, then, of all the spheres, both moving and counteracting, will be fifty-five. And if we do not add to the moon and the sun the movements we mentioned, all the spheres will be forty-seven in number.<sup>1376</sup>

Let this, then, be the number of the spheres, so that to take it that the immovable substances and starting-points, too, are just that many is reasonable—that it is necessary must be left to the stronger ones to claim.<sup>1377</sup> But if there can be no spatial movement that does not contribute to the moving of a star, and if furthermore every nature and every substance that is impassive and has intrinsically attained the best end must be regarded as an end, there can be no other nature beyond these, and this must be the number of the substances.<sup>1378</sup> For if there were others, they would produce movement by being an end of spatial movement. But there cannot be any other spatial movements beyond those mentioned. It is reasonable to infer this from the bodies that are moved. For if everything that carries something along naturally does so for the sake of what is carried along, and every spatial movement is the movement of something that is spatially moved, no spatial movement can be for the sake of itself or of another spatial movement, but all the movements must be for the sake of the stars. For if there is to be a spatial movement for the sake of a spatial movement, this latter will also have to be for the sake of something else. And so, since this cannot go on without limit, the end of every spatial

30 movement will be one of the divine bodies that are moved throughout the heaven.

(It is evident that there is but one heaven.<sup>1379</sup> For if there are many, as there are many humans, the starting-point for each will be one in form but in number many. But all things that are many in number have matter, for one and the same account applies to many, for example, humans, whereas Socrates is one. But the primary essence  
35 does not have matter, since it is an actuality.<sup>1380</sup> The primary immovable mover, therefore, is one both in account and in number. And so, therefore, is what is moved always and continuously. Therefore, there is only one heaven.)

There is a tradition handed down from the ancients of the earliest  
1074<sup>b1</sup> times and bequeathed to posterity in the shape of a myth to the effect that the heavenly bodies are gods and that the divine encompasses the whole of nature. The rest of the tradition has been added later in a mythical way with a view to the persuasion of ordinary people and  
5 with a view to its use for legal purposes and for what is advantageous. For they say that these gods are human in form or like some of the other animals, and also other features similar that follow from or are similar to those just mentioned. But if we separate the first point from these additions and grasp it alone, namely, that they thought that the primary substances were gods, we would have to regard it as divinely  
10 said, and that while it is likely that each craft and each philosophy has often been developed as far as possible only to pass away again, these beliefs about the gods have survived like remnants until the present.<sup>1381</sup> In any case, the beliefs of our forefathers and of our earliest predecessors is to this extent alone illuminating to us.

## A 9

Issues concerning the [divine] understanding involve certain puzzles.  
15 For while it seems to be the most divine of the appearances, the question of how it can have that character involves certain difficulties.<sup>1382</sup> For if on the one hand it understands nothing, where is its dignity? It would be just like someone asleep. And if on the other hand it does understand something, but this other thing controls it (since what it is, its substance, is not active understanding, but a capacity), it would not  
20 be the best substance. For it is because of actively understanding that esteem belongs to it.<sup>1383</sup>

Further, whether it is understanding [as a capacity] or active understanding that is the substance of it, what does it understand? For it is either itself or something else. And if something else, then either

always the same thing or sometimes this and sometimes that. Does it, then, make a difference or none at all whether it actively understands the noble or some random object? Or are there not certain things that it would be absurd for it to think of? It is clear, therefore, that it actively understands what is most divine and most estimable and does not change [its object], since change would be for the worse, and would already be a sort of movement.

First, then, if its substance is not active understanding but rather a capacity [to understand], it is reasonable to suppose that the continuity of its active understanding is laborious for it.<sup>1384</sup> Next, it is clear that something else would be more estimable than the understanding, namely, what is understood.<sup>1385</sup> And indeed [the capacity] to understand and active understanding will belong even to someone who actively understands the worst thing, so that if this is to be avoided (for there are in fact some things that it is better not to see than to see), the active understanding would not be the best thing.<sup>1386</sup> It is itself, therefore, that it understands, if indeed it is the most excellent thing, and the active understanding is active understanding of active understanding.<sup>1387</sup>

It appears, though, that scientific knowledge, perception, belief, and thinking are always of something else, and of themselves only as a by-product. Further, if to understand and to be understood are distinct, in virtue of which of them does the good belong to it? For the being for an act of understanding is not the same as the being for a thing understood. Or is it that in some cases the scientific knowledge is the thing? In the case of the productive sciences isn't it the substance and the essence without the matter? In the case of the theoretical sciences isn't it the account, the thing, and its active understanding? In the cases, then, where the thing understood and the active understanding of it are not distinct, namely, in those where the thing understood has no matter, they will be the same, and the active understanding will be one with the thing understood.<sup>1388</sup>

A further puzzle remains as to whether the thing understood is composite. For if it were, then the [divine] understanding would undergo change in understanding the parts of the whole.<sup>1389</sup> Or is not everything that has no matter indivisible? (Just as the human understanding [of such things] is, or the understanding even of composite things in a certain time—for it does not possess the good in [understanding] this or that [part], rather, in [understanding] a certain whole it possesses the best, being something else.<sup>1390</sup>) And is not this the condition of this understanding which, for all eternity, is an understanding of itself?

## A 10

We must also investigate in which way the nature of the whole possesses the good and the best—whether as something separated and intrinsic, or as its order.<sup>1391</sup> Or is it rather in both ways, like an army? For the good of an army is in its order, and is also the general—and more so the latter.<sup>1392</sup> For he is not due to the order, but it is due to him. All things are jointly ordered in a way, although not in the same way—even swimming creatures, flying creatures, and plants. And the order is not such that one thing has no relation to another but rather there is a relation.<sup>1393</sup> For all things are jointly ordered in relation to one thing—but it is as in a household, where the free people least of all do things at random, but all or most of the things they do are ordered, while the slaves and beasts can do a little for the common thing, but mostly do things at random.<sup>1394</sup> For this is the sort of starting-point that the nature is of each of them.<sup>1395</sup> I mean, for example, that all must at least come to be disaggregated [into their elements]; and similarly there are other things which they all share for [the good of] the whole.<sup>1396</sup>

However, we must not neglect to consider the impossibilities and absurdities that follow for those who say otherwise, and what sorts of things are said by those who speak in a more sophisticated way, and what sorts involve the fewest puzzles. For all of them make all things from contraries. But neither “all things” nor “from contraries” is correct, nor do they say how those things in which contraries are present will be made from them. For contraries are impassive with respect to each other.<sup>1397</sup> For us, on the other hand, this issue is resolved in a reasonable way, by there being a third thing.<sup>1398</sup> But others make one of the two contraries matter, as, for example, do those who make the unequal matter for the equal or the many for the one.<sup>1399</sup> And this too is resolved in the same way, since the one matter is not the contrary of anything.<sup>1400</sup> Further, all things, outside the one, will participate in the bad, since the bad is itself one of the elements.<sup>1401</sup> (Others do not even regard the good and the bad as starting-points. And yet in all things the good is most of all a starting-point.) They are, however, correct about this, namely, that the good is a starting-point. But in what way the good is a starting-point they do not say—whether as end, as mover, or as form.

Empedocles also speaks absurdly. For he makes love (*philia*) be the good, and this a starting-point both as mover (since it brings together) and as matter, since it is a part of the mixture.<sup>1402</sup> Now even if the same thing is coincidentally a starting-point both as matter and as mover, nonetheless their being is not the same.<sup>1403</sup> To which, then, does love

correspond? It is absurd, too, for strife to be incapable of passing way, since strife for him is the nature of the bad.<sup>1404</sup>

Anaxagoras makes the good his starting-point as mover, since the [divine] understanding moves things.<sup>1405</sup> But it moves them for the sake of something, so that this is a distinct thing, except in our way of describing it, namely, that the craft of medicine is in a way health.<sup>1406</sup> It is absurd, too, not to posit a contrary to the good and to the understanding.<sup>1407</sup> But all those who speak of contraries fail to use contraries, unless we reformulate what they say.<sup>1408</sup>

Also, why some things are capable of passing away while others are incapable of passing away, no one says. For they make all beings from the same starting-points. Further, some make the beings from what is not, while others in order to avoid having to do this, make all things one.

Further, why there will always be coming to be, and what the cause of coming to be is, no one says.<sup>1409</sup> And for those who posit two starting-points there must be another starting-point with more control.<sup>1410</sup> And for those who posit the Forms there will be yet *another* starting-point with more control.<sup>1411</sup> For why did things come to participate, or why do they participate, [in the Forms]?

Also, for the others there must be some contrary to theoretical wisdom and the most estimable science, but not for us.<sup>1412</sup> For nothing is contrary to the primary thing, since all contrary things have matter, and such things are potential.<sup>1413</sup> The contrary state, ignorance, is directed toward the contrary, but to the primary thing nothing is contrary.<sup>1414</sup>

Further, if beyond the perceptibles there are not going to be any other things at all, then there will not be a starting-point, order, coming to be, or celestial movements, but always a starting-point of the starting-point, as there is for the theologians and all the physicists.<sup>1415</sup>

If, on the other hand, the Forms or the numbers are going to be the starting-points, they will be cause of nothing—or, if not that, at least not of movement. Further, how will what is a magnitude and continuous come from what lacks magnitude? For number will not produce something continuous, either as mover or as form.

But again there will not be any of the *contrary* things that will just be what is both capable of acting [on things] and capable of moving [things], since it would admit of not being.<sup>1416</sup> But again acting [on things] is posterior to capacity. Therefore, beings will not be eternal. But they are. Therefore, one of these must be done away with. And we have said how.<sup>1417</sup>

Further, about what makes numbers *one*, or soul and body, or in  
 35 general form and thing, no one says anything. Nor is it possible, unless  
 one says it the way we do, to say in what way the mover makes them  
 one.<sup>1418</sup> And those who say that mathematical number is primary, and  
 that in the same way there is again and again some other contiguous  
 1076<sup>a</sup>1 substance and a starting-point of each, make the substance of the uni-  
 verse episodic (since one substance contributes nothing to another by  
 being or not being) and posit many starting-points.<sup>1419</sup>

Beings, however, do not wish to be badly governed: "To have many  
 rulers is not good; let there be one ruler."<sup>1420</sup>



## BOOK MU (XIII)

### M 1

Where the substance of perceptibles is concerned, we have said what it is, dealing with matter in the methodical inquiry into natural things, and later with substance as activity.<sup>1421</sup> But since our investigation is into whether or not beyond the perceptible substances there is any that is immovable and eternal, and, if there is, what it is, we must first get a theoretical grasp on what is said by others, so that, if there is anything they say incorrectly, we may not be liable to the same objections, whereas if there is any belief common to us and them, we may not on that account have any private misgivings against ourselves. For we must be content if we state some things better than our predecessors and others no worse.

There are two beliefs on this subject. Some people say that the objects of mathematics—for example, numbers, lines, and things of that kind (*genos*)—are substances, and in addition that the Ideas are. And since some make these two distinct kinds (*genos*) of things—the Ideas and the mathematical numbers—and some posit a single nature for both, whereas some others say that only the objects of mathematics are substances, we must investigate the objects of mathematics first, without positing any other nature for them—not asking, for example, whether they are in fact Ideas or not, or whether they are starting-points and substances of beings or not, but only whether, considered as objects of mathematics, they exist or not, and if they exist, in what way they do.<sup>1422</sup> Then after this we must separately investigate the Ideas themselves but in general terms and to keep with the usual way of doing things, since most of the points have been made also in the external accounts.<sup>1423</sup> Further, the greater part of our account must relate to the earlier question, namely, when we are investigating whether substances and the starting-points of beings are numbers and Ideas.<sup>1424</sup> For after the Ideas this remains as a third investigation.

If indeed the objects of mathematics exist, however, they must exist either in perceptibles, as some say, or separate from perceptibles (there are also some who say this), or, if they exist in neither way, either they do not exist or they exist in some other way. So our dispute will not be about whether they exist but about the way they do.

## M 2

1076<sup>b</sup>1 That it is impossible for the objects of mathematics to exist *in* perceptibles, and at the same time that the argument for it is fabricated, has also been stated in going through the puzzles, where we pointed out that it is impossible for two solids to be in the same place at the same time, and further that by the same argument the other capacities and natures would also be in the perceptibles and none would exist separately.<sup>1425</sup>

5 This has been said already, but in addition it is evident that it is impossible on this view for any body whatever to be divided. For it would have to be divided at a plane, and the plane at a line, and the line at a point, so that if the point cannot be divided, neither can the line, and if the line cannot, neither can the others. What difference, then, does it make whether perceptibles are natures of this indivisible sort, or, without being such themselves, have such natures in them?  
10 For the result will be the same. For if the perceptibles are divided, the others will be divided as well, or else the perceptibles will not be divided either.

15 But then again it is not possible for such natures to exist separately. For if there are to be solids beyond the perceptible ones, separate from them, and prior to the perceptible ones, it is clear that beyond the planes there will necessarily also be distinct and separate planes, as well as points and lines (for the same argument applies). But if this is so, beyond the planes, lines, and points of the mathematical solid there will again be others that are separate. (For in-composites are prior to composites, and if indeed there are non-perceptible bodies prior to the perceptible ones, by the same argument there are also planes that are intrinsic beings and are prior to those in the immovable solids.<sup>1426</sup> And so these lines and solids are distinct from those that exist together with the separate solids.<sup>1427</sup> For the latter exist together with the mathematical solids, whereas the former are prior to the mathematical solids.) Again, therefore, there will be lines belonging to  
20 these planes, and prior to them there will need to be distinct lines and points, because of the same argument. And prior to the points in the prior lines there will be distinct prior points, though there will be no others prior to these.

25 The accumulation, then, becomes absurd. For we get one lot of solids beyond the perceptible ones; three lots of planes beyond the perceptible ones—the ones beyond the perceptible ones, the ones in the mathematical solids, and the ones beyond the ones in those solids; and four lots of lines; and five lots of points.<sup>1428</sup> So with which of these  
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will the mathematical sciences be concerned? Certainly not with the planes, lines, and points in the immovable solids, since a science is always concerned with what is prior.

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And the same argument applies to numbers as well. For beyond each lot of points there will be distinct units, and also beyond each lot of beings there will be the perceptibles, and next the intelligible objects, so that there will be unlimited kinds (*genos*) of mathematical numbers.

Further, how is it possible to resolve the very issues also gone over in the discussion of puzzles?<sup>1429</sup> For the objects of astronomy will be beyond the perceptibles in the same way as the objects geometry is about. But how is it possible for there to be a heaven and its parts [beyond the perceptible one], or anything else with movement? Similarly too with the objects of optics and of harmonics, since there will be both voiceable sound and seeable thing beyond the perceptible and particular ones. So it is clear that the same also holds of the other sorts of perception and the other perceptibles—for why of this one more than that one? But if that is the case, there will also be animals [beyond the perceptible ones], if indeed there are sorts of perception.

1077<sup>a</sup>1

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Further, there are certain propositions stated by the mathematicians that are universal and go beyond these substances.<sup>1430</sup> Here too, then, there will be another intermediate substance separate both from the Ideas and from the intermediates, that is neither number nor point nor magnitude nor time.<sup>1431</sup> And if this is impossible, it is clear that it is also impossible for the others to exist separate from the perceptibles.

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And in general, conclusions follow that contradict both the truth and the things it is usual to take to be the case, if we posit that the objects of mathematics exist in this way, as certain natures that are separate. For because they exist in this way they must be prior to perceptible magnitudes, but in fact they are posterior, since incomplete magnitude, while prior in coming to be, is posterior in substance, as the inanimate is to the animate.<sup>1432</sup>

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Further, in virtue of what on earth will a mathematical magnitude be one?<sup>1433</sup> For the things that exist here are one in virtue of soul or a part of soul or something else that is reasonable.<sup>1434</sup> But if a thing is not like that, it is many and is split into parts. But a mathematical magnitude is divisible and quantitative, so what is the cause of its being one and holding together?

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Further, their comings to be make the difficulty clear. For first length comes to be, then breadth, finally depth, and then it is complete. If, then, what is posterior in coming to be is prior in substance, the body

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will be prior to the plane and the line. And in this way, too, it is more complete and more of a whole, because it becomes animate. But how could a line or a plane become animate? The supposition would be beyond our perceptual capacities.<sup>1435</sup>

Further, a body is a sort of substance. For it already has completeness in a way. But how can lines be substances? Neither as a form or shape, like the soul (if indeed it is something of this sort), nor as matter is, like the body. For nothing is seen to be capable of being composed of lines or planes or points, though if these were some sort of material substance, things would have been seen to be capable of undergoing this.<sup>1436</sup>

Grant, then, that they are prior in account. Still not everything that is prior in account is prior in substance too. For those things are prior in substance [to others] which, when separated, surpass [them] in being, whereas things are prior in account to those things whose accounts are composed of *their* accounts.<sup>1437</sup> And these do not apply together.<sup>1438</sup> For if attributes are not beyond the substances (for example, moving or pale), the pale is prior to the pale human in account but not in substance. For it does not admit of being separated, but is always together with the compound (and by the compound I mean the human who is pale), so that it is evident that neither is what results from abstraction prior nor is what results from an addition posterior.<sup>1439</sup> For it is from an addition to the pale that the pale human is said of things.

It has been adequately stated, then, that the objects of mathematics are not substances more than bodies are, that they are not prior to perceptibles in being but only in account, and that it is not possible for them to be in any way separated.<sup>1440</sup> But since it was not possible for them to exist *in* perceptibles either, it is evident that either they do not exist at all, or do so in a certain way, and because of this do not exist unconditionally. For things are said to be in many ways.

### M 3

For just as the universal propositions of mathematics are not about separate objects that exist beyond the magnitudes and the numbers, but are about magnitudes and numbers, although not insofar as they are such as to have magnitudes or to be divisible, it is clearly possible that there should also be statements and demonstrations concerning perceptible magnitudes, although not insofar as they are perceptible but insofar as they are of such-and-such a sort. For just as there are many statements about things only insofar as they are moving, separate from what each of them is and from their coincidents, and since it is not

necessary because of this for there to be either a movable thing separate from the perceptible ones or some such nature distinguishable in them, so too in the case of movable things there will be statements and sciences concerning them, not insofar as they are movable, but only insofar as they are bodies, or again only insofar as they are planes, or only insofar as they are magnitudes, or only insofar as they are divisible, or are indivisibles having position, or indivisibles.

So, since it is true to say unconditionally not only that separable things exist but also that inseparable ones do (for example, that movable things exist), it is also true to say unconditionally that the objects of mathematics exist, and that they are such as they are said to be. And just as it is also true to say unconditionally of the other sciences that they are of this or that, not of what is coincidental to it (for example, not of pale, if the healthy thing is pale and the science is of being healthy) but of the thing that each is of (of being healthy if [it is concerned with someone] insofar as he is healthy, of human if insofar as he is human), so it is too with geometry. If the things it is of are coincidentally perceptible, but it is not of them insofar as they are perceptible, the mathematical sciences will not be of perceptibles—nor, however, will they be of other things separate from perceptibles.

Many coincidents, though, belong intrinsically to things insofar as they are, each of them, of a certain sort—for example, insofar as the animal is female and also insofar as it is male, there are attributes special to it (yet there is no male or female separate from the animals).<sup>1441</sup> So there are also such attributes of things only insofar as they are lengths or insofar as they are planes. And to the extent, accordingly, that [a science] is concerned with what is prior in account and simpler, to that extent the more exactness it has (this is what simplicity does).<sup>1442</sup> So there is more exactness without magnitude, certainly, than with magnitude, and most without movement, but if there is movement, there is most with the primary movement, since this is the simplest, and of *this* the one that is uniform.<sup>1443</sup>

The same account also applies to harmonics and optics. For neither gets a theoretical grasp on a thing insofar as it is a voiceable sound or a seeable thing but insofar as it is lines and numbers (these being attributes that properly belong to the former things). And mechanics is the same way.

So if we posit things as separated from their coincidents and investigate them as such, we will not falsify anything because of this, any more than when we draw a line on the ground and call it a foot long when it is not a foot long. For the falsification is not included among the premises.

The best way, though, of getting a theoretical grasp on a given thing would be this—if we posit as separate what is not separate, in just the way the arithmetician and the geometer do. For the human insofar as he is human is one and indivisible. And the arithmetician takes him to be one and indivisible, and then gets a theoretical grasp on what is coincident with a human insofar as he is indivisible. The geometer, on the other hand, gets such a grasp on him neither insofar as he is human nor insofar as he is indivisible but insofar as he is a solid. For it is clear that the attributes that would belong to him even if he were somehow not indivisible can still belong to him without these.<sup>1444</sup> So, because of this, the geometers speak correctly, and it is about beings that they speak, and these are beings. For being is twofold, on the one hand actual, on the other in the material way.<sup>1445</sup>

Since the good and the noble are distinct, however (for the good is always found in action, whereas the noble is found also in immovable things), those who assert that the mathematical sciences say nothing about the noble or the good are speaking falsely.<sup>1446</sup> For these sciences say and show these, and in the highest degree. For if they do not name them, but show their works and their accounts, it does not follow that they are not saying anything about them. For the chief kinds (*eidos*) of the noble are order and proportion and definiteness, which are what the mathematical sciences show in the highest degree. And since, at any rate, these (I mean, for example, order and definiteness) are evidently causes of many things, it is clear that they would say that this sort of cause, as well—namely, the noble—is a cause in a certain way. But we shall speak more notably about this elsewhere.<sup>1447</sup>

## M 4

About the objects of mathematics, then, that they are beings and in what way they are beings and in what way they are prior and in what way not prior, let this much be said. Now concerning the Ideas, we must first investigate the notion of Idea, not connecting it in any way with the nature of the numbers, but in the way those who first said that there are Ideas took it to be at the start.

The notion of Forms occurred to the people who stated it because where the truth is concerned they were convinced by the Heraclitean arguments that all perceptible things are always flowing, so that if indeed there is to be scientific knowledge of anything and wisdom, there must be some other natures, beyond the perceptible ones, that are permanent, since there is no scientific knowledge of the flowing ones.<sup>1448</sup>

Socrates, on the other hand, busied himself about the virtues of character, and in connection with these was the first to inquire into universal definition.<sup>1449</sup> (For among the physicists Democritus latched on to this only a little, and defined, after a fashion, the hot and the cold, while the Pythagoreans had previously done this for a few things, whose accounts they connected to numbers—for example, what opportune is, or the just, or marriage.<sup>1450</sup>) It was reasonable, though, that Socrates was inquiring into the what-it-is. For he was inquiring in order to deduce, and the what-it-is is a starting-point of deductions.<sup>1451</sup> For at that time there was not yet the strength in dialectic that enables people, even separately from the what-it-is, to investigate contraries, and whether the same science is a science of contraries.<sup>1452</sup> For there are two things that may be fairly ascribed to Socrates—inductive arguments and universal definition, both of which are concerned with a starting-point of scientific knowledge. However, whereas Socrates did not make the universals separable nor the definitions, the others did separate them, and these were the sorts of beings they called Ideas, so that it followed for them, pretty much by the same argument, that there are Ideas of all things that are spoken of universally.<sup>1453</sup>

And so the result was somewhat as if a person who wished to count the beings were to think that he would not be able to do it while there were so few of them, but, having made more, would then count them.<sup>1454</sup> For the Forms are (one might almost say) more numerous than the perceptible particulars, yet it was in inquiring into the causes of these that they proceeded from them to the Forms.<sup>1455</sup> For in each case there is something that has the same name and is beyond the substances, and also in the case of the others there is a one over many, both over those that exist here and over the eternal ones.<sup>1456</sup> Further, of the ways in which it is shown that there are Forms, none makes these evident.<sup>1457</sup> For from some no deduction is necessarily generated, whereas from some others Forms are also generated of things of which they think there are no Forms.<sup>1458</sup> For, in accord with the arguments from the sciences, there will be Forms of all things of which there are sciences, and in accord with “the one over many” there will be Forms even of negations, whereas in accord with the argument that there is understanding of a thing that has passed away there will be Forms of things that pass away, since there is an appearance of them. Further, of the most exact of the arguments, some produce Ideas of relatives, of which they say there is not an intrinsic kind (*genos*), whereas others introduce the *Third Man*.<sup>1459</sup>

And in general the arguments for the Forms do away with the things that those accepting Forms prefer to the existence of the Ideas, since

it follows that it is not the dyad that is primary but number, that prior to number is the relative, and that this is prior to the intrinsic, as well as all the other things that certain people, by following out the beliefs held about the Forms, have accepted contrary to the starting-points.<sup>1460</sup>

Further, by the supposition according to which they say that there are Ideas, Forms will exist not only of substances but also of many other things (for the intelligible object is a one not only where substances are concerned but also in the case of non-substances, and there are sciences not only of substance), and countless other such difficulties arise.<sup>1461</sup> On the other hand, according to the necessities of the case and to the beliefs held about them, if the Forms are to be participated in, there must be Ideas of substances only, for they are not participated in coincidentally, but rather a thing must participate in each in this way, namely, insofar as it is not said of an underlying subject (I mean, for example, if something participates in double-itself, it also participates in the eternal, but does so coincidentally, since it is coincidental to the double that it is eternal), so that the Forms will be substance.<sup>1462</sup> But it is the same things that signify substance here as over there—or what will it mean to say that there is something beyond these things here, the one over the many? And if the Ideas and the things that participate in them have the same Form, there will be something common to them. For why should the two be one and the same in the case of the twos that pass away, and in the many eternal twos, rather than in the case of two-itself and some particular two?<sup>1463</sup> But if they do not have the same Form, they would be homonymous, just as if someone were to call Callias and a wooden statue a man, seeing nothing communal between them.

But if we are to posit that in other respects the common accounts apply to the Forms—for example, that plane figure and the rest of the parts of the account apply to the circle-itself, but *the what-it-is* must be added, we must investigate whether this is not entirely empty.<sup>1464</sup> For to what is this to be added? To center, to plane, or to all the parts? For all the things in the substance are Ideas—for example, the human and the two-footed. Further, so-and-so-itself must be added, just like the plane, some sort of nature that will be present in all the Ideas as their genus.<sup>1465</sup>

## M 5

Above all, though, we might go through the puzzles of what on earth the Forms contribute to perceptibles, either to those that are eternal or to those that come to be and pass away, since they are not the causes of movement or of any change whatsoever in them.<sup>1466</sup> But then they



are also of no help at all either as regards the scientific knowledge of the other things, since they are not their substance (otherwise they would be in them), or in regard to their being, if they are not present in the things that participate in them. For if they were, they might perhaps seem to be causes in the way that what is white is a cause when mixed with a white thing. But this account is all too readily upset—it is one that first Anaxagoras and later Eudoxus stated (in going through the puzzles), and also certain others.<sup>1467</sup> For it is easy to collect many impossibilities against a belief of this sort.

But then neither is it possible to say, in any of the familiar ways of speaking, that the other things come *from* the Forms. To say that the Forms are paradigms and that the other things participate in them is to utter empty words and poetic metaphors. For what is it that, looking to the Ideas, is doing the work? It is possible for anything both to be and come to be without being copied from something, so that whether Socrates exists or not, someone could become like him.<sup>1468</sup> And the same would clearly hold even if Socrates were eternal. Also, there will be more than one paradigm of the same thing and so more than one Form—for example, the Forms of the man will be the animal and the two-footed, as at the same time will be man-itself. Further, the Forms will be paradigms not only of the perceptibles but also of themselves—for example, the genus, as genus of the several species.<sup>1469</sup> And so the same thing will be paradigm and copy.

Further, it would seem to be impossible for the substance and that of which it is the substance to be separate. And so how could the Ideas, being the substances of things, be separate from them?

In the *Phaedo*, however, it is said in this way: the Forms are causes both of the being and of the coming to be of things.<sup>1470</sup> But even if the Forms do exist, things would still not come to be unless there was a moving cause.<sup>1471</sup> Also, many other things come to be—for example, a house or a ring—of which they say there are no Forms. And so it is clear that it is also possible for the things of which they say there are Forms both to be and to come to be through the same causes as the things we mentioned just now, but not because of the Forms.<sup>1472</sup> But where the Ideas are concerned it is possible, both in this way and by more logico-linguistic and more exact arguments, to collect many objections like those we considered.<sup>1473</sup>

## M 6

Since we have discussed these issues, it is well to get a theoretical grasp again on the consequences where numbers are concerned for those

who say that they are separable substances and primary causes of beings.

If number is indeed a sort of nature and its substance is nothing other than just number, as some people say, then one of two things necessarily follows: *Either* [1a] there is a first in it and a successor, each being different in species, and this applies directly to the units, and any unit is non-combinable with any other unit.<sup>1474</sup> Or [1b] units are all directly successive and any combinable with any, as they say is the case with mathematical number, since in mathematical number no unit differs in any way from any other. Or [1c] some units are combinable and some are not. Suppose, for example, that two is first after one, and then three, and in this way, then, the rest of the numbers, and that the units in each number are combinable (for example, those in the first two numbers are combinable with each other, and those in the first three numbers with each other, and likewise in the case of the other numbers), whereas the units in the two-itself are non-combinable with those in the three-itself, and likewise with the other successive numbers. This is why mathematical number is counted, after one, two (which includes another one), and then three (which includes another one in addition to those two), and the rest likewise, whereas this second sort of number is counted, after one, a distinct two (which does not include the first one), and a distinct three (which does not include two), and similarly with the other numbers. Or [2] one sort of number is like [1a] the first we mentioned, another is like [1b] the sort the mathematicians speak about, and a third like [1c] the sort mentioned last.

Further, these sorts of numbers must either be separable from things or not separable but in perceptibles (not, however, in the way we first investigated, but in such a way that the perceptibles are composed of numbers that are present in them), or some are and some not, or all are.<sup>1475</sup>

These, then, are of necessity the only ways in which numbers can exist. And of those who say that the one is starting-point, substance, and element of all things, and that number is composed of it and something else, pretty much everyone has described them in one of these ways (except that no one has said that *all* units are non-combinable). And this has occurred quite reasonably, since no further way is possible beyond those mentioned.

Thus some say that both sorts of numbers exist, the sort with a before and after being Forms, and mathematical number being beyond the Ideas and the perceptibles, and both being separable from the perceptibles.<sup>1476</sup> Others, though, say that only mathematical number exists, and is the first of beings, separate from the

perceptibles.<sup>1477</sup> And the Pythagoreans, too, say that there is one sort, namely, the mathematical, except they say that it is not separate, but rather perceptible substance is composed of it. For they construct the whole heaven from numbers, except not numbers composed of units, since they take the units to have magnitude.<sup>1478</sup> But how the first one was composed so as to have magnitude they seem at a loss to say.<sup>1479</sup>

Another thinker says that the first sort of number, Form number, alone exists, and some say that mathematical number is the same as this.<sup>1480</sup>

Similarly where lines, planes, and solids are concerned. For some people think that those that are the objects of mathematics and those that come after the Forms are distinct.<sup>1481</sup> But of those who say otherwise some speak of the mathematical numbers in a mathematical way (namely, those who do not make the Ideas numbers or say that the Ideas exist), while others speak of the mathematical numbers but not in a mathematical way, since they say that not every spatial magnitude is divisible into magnitudes, and that not just any two units make two.<sup>1482</sup> All those who say, though, that the one is an element and starting-point of beings take numbers to be composed of units, except the Pythagoreans, who take them to have magnitude, as was said earlier.<sup>1483</sup>

How many ways it is possible to speak of numbers, and that all the ways have been mentioned, is evident from these comments. They are all impossible, but some perhaps more than others.

## M 7

First, then, we must investigate whether the units are combinable or non-combinable, and if non-combinable, in which of the ways we distinguished.<sup>1484</sup> For it is possible for any unit to be non-combinable with any unit, and it is also possible for those in the two-itself to be non-combinable with those in the three-itself, and in this way, then, for those in each of the first [or Form] numbers to be non-combinable with each other.

[1] Now, if all units are combinable and without difference, it is mathematical number that results, and only this one, and the Ideas cannot be the numbers. For what sort of number will man-itself or animal-itself or any other Form be? For there is one Idea of each thing—for example, one of man-itself and another of animal-itself. The similar and undifferentiated numbers, on the other hand, are unlimitedly many, so that this three is no more man-itself than any other three. But

if the Ideas are not numbers, they cannot exist at all either. For from what starting-points will the Ideas come? For number comes from the one and the indefinite dyad, and the starting-points and elements are said to be starting-points and elements of number, and so the Ideas cannot be ranked as either prior or posterior to the numbers.<sup>1485</sup>

[2] If, on the other hand, units are non-combinable, in the sense that none is combinable with any other, then this sort of number cannot be mathematical number. For mathematical number is composed of undifferentiated units, and the things proved about it fit it as such. But it cannot be Form number either. [2a] For the two will not be the first thing to come from the one and the indefinite dyad, followed by the successive numbers, in the way that we say "two, three, four. . ." For the units in the first two are generated at the same time—whether, as the first person [to introduce Forms] said, when the equals have been equalized, or in some other way.<sup>1486</sup> [2b] Besides, if one unit is to be prior to the other, it will also be prior to the two composed of these.<sup>1487</sup> For whenever one thing is prior and another posterior, a thing composed of both of them will be prior to the latter and posterior to the former.<sup>1488</sup>

[2c] Further, since the one-itself is first, and then there is a one that is first among the others but second after it, and again a third, second after the second one and third after the first one, and so the units would be prior to the numbers after which they are named. For example, there will be a third unit in two before three exists, and a fourth in three, and a fifth, before these numbers exist.<sup>1489</sup>

[2d] Now none of these thinkers has said that the units are non-combinable in this way, but in accord with their starting-points even this way of doing it is reasonable, although in accord with the truth it is impossible. For it is reasonable for units both to be prior or posterior if indeed there is a first unit and a first one, and similarly with twos, if indeed there is a first two. For after the first it is reasonable, indeed necessary, for there to be a second, and if a second, a third, and so on with the others in succession. (But to say both things at the same time, that a unit is first and another unit is second after the one, and also that two is first after it, is impossible.) But these thinkers make a first unit, and a first one, but not after that a second unit and a third, and a first two, but not after that a second two and a third.<sup>1490</sup>

[2e] It is evident, too, that it is not possible if all units are non-combinable for there to be a two-itself and a three-itself, and so on with the other numbers. For whether units are undifferentiated or different from each other, number must be counted by addition—for example, two by adding another one to the one, three by adding another one to

the two, and four similarly. But if this is so, numbers cannot come to be in the way these thinkers generate them from the dyad and the one. For two becomes part of three and three of four, and the same happens in the case of the succeeding numbers. But [on their view] four comes from the first two and the indefinite dyad—two twos beyond the two-itself.<sup>1491</sup> Otherwise the two-itself, and one other two in addition, will be part of four. And two will also come from the one-itself and another one. But if so, the other element cannot be the indefinite dyad, since it generates one unit, not a definite two. Further, beyond the three-itself and the two-itself how can there be other threes and twos? And in what way are they composed of prior and posterior units? In fact all this is absurd and fabricated, and it is impossible for there to be a first two and then a three-itself. Yet there must be, if indeed the one and the indefinite dyad are to be elements. But if the consequences are impossible, it is also impossible for these to be the starting-points.

If, then, any unit is differentiated from any other, these and other similar things necessarily follow. [3] If, however, the units in different numbers are differentiated, and only those in the same number are undifferentiated from each other, even so the difficulties that follow are no less.<sup>1492</sup>

[3a] For example, in the ten-itself there are ten units, and the ten is composed both of them and of two fives. But since the ten-itself is not some random number or composed of any random fives (or of any random units either), the units in this ten must differ.<sup>1493</sup> For if they do not differ, neither will the fives of which the ten is composed. But since these differ, the units will also differ. But if they differ, will there be no other fives present in the ten but only these two, or will there be others? If there are not, it is absurd. But if there are, what sort of ten will be composed of them? For there is no other ten present in the ten apart from itself. But then it is in fact necessary [on their view] that the four not be composed of any random twos. For the indefinite dyad, they say, by taking on the definite two, produced two twos, since it was a two-maker of what it took on.

[3b] Further, how is it possible for the two to be a sort of nature beyond the two units, or the three beyond the three units? For either it is by one thing's participating in the other, as there is a pale human beyond pale and human, since it participates in them, or else when one is some differentia of the other, as the human is beyond animal and two-footed.<sup>1494</sup>

[3c] Further, some things are one by contact, some by mixture, some by position, but none of these can belong to the units of which two or three is composed. But rather, just as two men are not some one

thing beyond both of them, so the same must also hold of the units. And their being indivisible will make no difference. For points too are  
 25 indivisible, nonetheless a pair of points is not another thing beyond the two of them.

[3d] Neither, though, must we neglect to consider this, namely, that it follows that there are prior and posterior twos, and similarly with the other numbers. For grant that the twos in the four are simultaneous with each other. Yet these are prior to those in the eight, and just  
 30 as the two generated them, they generated the fours in the eight-itself. So if the first two is an Idea, these twos will themselves be Ideas of some sort.<sup>1495</sup> And the same account also applies to the units, since the units in the first two generate the four units in the four. So all the  
 35 units become Ideas and an Idea will be composed of Ideas. And so it is clear that the things of which these are in fact the Ideas will also be composite—so, for example, someone might say that the animals are composed of animals, if there are Ideas of them.

[3e] In general, to differentiate the units in any way is absurd and fabricated (and by “fabricated” I mean “forced to fit with a hypothesis”). For neither in quantity nor in quality do we see unit differing  
 5 from unit, and number must be either equal or unequal (all number but especially the sort composed of units), so that if one number is neither greater nor less than another, it is equal to it. But things that are equal and wholly undifferentiated are taken to be the same in the case of numbers. If not, not even the twos in the ten-itself will be undifferentiated, though they are equal. For what cause will someone have for  
 10 saying that they are undifferentiated?<sup>21496</sup>

[3f] Further, if every unit plus another unit makes two, a unit from the two-itself and a unit from the three-itself will make a two, which will thus be composed of differentiated units, and so will it be prior to the three or posterior?<sup>21497</sup> It seems, rather, that it must be prior, since  
 15 one of the units is simultaneous with the three and the other is simultaneous with the two. And we, for our part, take it that one plus one, whether the things are equal or unequal, is two—for example, the good plus the bad or human plus horse. But to those who say the things under consideration this does not hold even of *units*.

[3g] If the three-itself is not a larger number than the two, it is a wonder, but if it is larger, it is clear that there is a number in it equal to the two and thus undifferentiated from the two-itself. But this is not possible, if there is a first and a second number.<sup>1498</sup>

[3h] And the Ideas will not be numbers either. For on this particular point those people are correct who say that the units must be different  
 25 if indeed there are to be Ideas—as was said before.<sup>1499</sup> For the Form is

one, whereas if the units are not different, the twos and threes will also be undifferentiated.<sup>1500</sup>

[31] That is also why they have to say that when we count this way—one, two, . . . —we do not proceed by adding to the number that already exists (for the generation will not in that case be from the indefinite dyad and nor can a number be an Idea, since then one Idea will be present in another and all the Forms will be parts of one Form). And so with a view to their hypothesis they speak correctly but, taken as a whole, incorrectly. For they do away with too many things—although they will say that this question itself involves a puzzle, namely, whether, when we count and say “one, two, three,” we count by addition or by separate parts.<sup>1501</sup> Really, though, we do it in both ways, which is why it is ridiculous that this difficulty should lead to so great a difference of substance.<sup>1502</sup>

## M 8

[3j] First of all it is well to determine what the differentia of a number is, and of a unit if there is one. Units must differ either in quantity or in quality, but neither of these seem to admit of belonging to units.<sup>1503</sup> But number insofar as it is number differs in *quantity*. If, then, the units too did differ in quantity, number would differ from number even when equal in quantity of units. Further, are the units greater or smaller, and do the later ones increase, or the contrary? All these are unreasonable. But they cannot differ in quality either, since no affection can belong to them—for they say that to numbers too quality belongs posterior to quantity.<sup>1504</sup> Further, quality could not come to them either from the one or from the dyad. For the former is no quality, and the latter is quantity-producing, since this nature is what causes beings to be many. If in fact units differ in some other way, they should state this at the start especially, and determine the differentia of a unit, and especially why it must belong [to units].<sup>1505</sup> Otherwise what differentia are they talking about?

It is evident, then, that if indeed the Ideas are numbers, the units cannot all be combinable, nor can they be non-combinable with each other in either of the two ways.<sup>1506</sup>

But the way that some other people speak about numbers is not correct either. These are the people who think that Ideas do not exist, whether unconditionally or as being certain numbers, but that the objects of mathematics do exist, that the numbers are primary among beings, and that the starting-point of them is the one-itself.<sup>1507</sup> For it is absurd for there to be, as they say, a one that is primary among the ones, but not a two among the twos, or a three among the threes,

since the same argument applies to them all.<sup>1508</sup> If, then, what holds of the numbers is like this, and someone posits that mathematical number alone exists, the one is not a starting-point (for the sort of one that the one is must differ from the other units; and, if this is so, there must also be a two that is primary among the twos, and similarly with the other successive numbers). But if the one is the starting-point, what holds of the numbers must rather be as Plato used to claim, and there must be a first two and three, and the numbers must not be combinable with each other. On the other hand, if we posit this, many impossible results follow, as we have said.<sup>1509</sup> But then one or the other *must* hold, so that if neither does, number cannot be separable.

It is evident from this, too, that the third version is the worst, in which Form number and mathematical number are the same number.<sup>1510</sup> For of necessity two errors then meet in the one notion. For, first, mathematical number cannot possibly be this way—on the contrary, special hypotheses must be posited to keep the view going.<sup>1511</sup> And, second, all the things that follow for those who speak of number as Form must also be accepted.

The Pythagorean version in one way has fewer difficulties than the aforementioned ones, but in another way has others special to itself. For by not making number separable many of the impossibilities are done away with; but for bodies to be composed of numbers, and for this number to be mathematical, is impossible. For it is not true to say that there are indivisible spatial magnitudes, but even if it were true that they were fully this way, units at least have no magnitude—and how can a magnitude be composed of things that are indivisible? Moreover, arithmetical number, at any rate, is composed of units, whereas these thinkers say that beings are numbers—at any rate, they apply their speculations to bodies on the supposition that the latter beings are composed of numbers.<sup>1512</sup>

If, therefore, it is necessary, if indeed number is an intrinsic being, for it to exist in one of the aforementioned ways, and if none of these is possible, it is evident that number has no such nature as is furnished for it by those who make it separable.<sup>1513</sup>

[a1] Further, is each unit composed of the great and the small when they are equalized, or one of the small, another of the great?<sup>1514</sup> If the latter, each is not composed of all the elements, nor will the units be undifferentiated, since in one the great belongs and in another the small, which is contrary in nature to the great.

[a2] Further, how about the units in the three-itself? For one is odd man out. But perhaps it is because of this that they make the one-itself the middle place in the odd numbers.<sup>1515</sup> And if each of its units is



composed of both the great and the small equalized, how will the dyad, which is one nature, be composed of them? Or how will it differ from the unit?<sup>1516</sup>

[a3] Further, the unit is prior to the dyad, since, when it is done away with, the dyad is done away with.<sup>1517</sup> Hence it must be the Idea of an Idea, because it is prior at any rate to an Idea, and comes to be before it. From what, then? For the indefinite dyad is a *two-maker*.<sup>1518</sup>

[a4] Further, number must be either limited or unlimited. For these thinkers make the numbers separable, so that it is not possible for neither of these to belong to them.<sup>1519</sup> But that it is assuredly not possible for it to be unlimited is clear. For an unlimited number is neither odd nor even, but the generation of numbers is always of an odd number or of an even one—in one way, when the one applies to an even number, an odd number is produced; in another way, when the dyad applies, the numbers got from the one by doubling are produced; in another way, when the odd numbers apply, the other even numbers are.<sup>1520</sup>

[a5] Further, if every Idea is an Idea of something, and the numbers are Ideas, the unlimited number will be the Idea of something, either of a perceptible or of something else. Yet this is not possible either in accord with their hypothesis or in accord with reason—they do, though, arrange the Ideas this way.<sup>1521</sup>

[a6] If, on the other hand, number is limited, how far does it go? With regard to this not only the that but the why should be stated.<sup>1522</sup> But surely if the number series goes up to ten, as some people say, first, the Forms will soon run out—for example, if three is man-itself, what number will horse-itself be? For a number that is a given thing-itself [is in a series that] goes up to ten. It must, then, be one of the numbers among these, since it is these that are substances and Ideas. [But even if it is], nevertheless, they will run short, since the Forms of the animal will exceed them.

[a7] At the same time, it is clear that if it is in this way that the three is man-itself, then the other threes are as well (since those in the same numbers are similar), so that there will be an unlimited number of men—if each three is an Idea, each will be man-itself; if not, they will all be men at least.<sup>1523</sup>

[a8] Also, if the smaller number is part of the greater (number that is composed of the combinable units present in the same number), then if the four-itself is an Idea of something (for example, horse or pale), man will be part of horse, if man is two.

[a9] It is absurd, too, for there to be an Idea of ten but not of eleven or of the succeeding numbers.

[a10] Further, there both are and come to be things of which there are no Forms. So why are there not Forms of these too? It follows that the Forms are not causes.<sup>1524</sup>

[a11] Further, it is absurd if the number series up to ten is a being and a Form to a higher degree than the ten-itself, even though there is no generation of it as one thing, whereas of the latter there is.<sup>1525</sup> But they proceed on the assumption that the series up to ten is a complete number series. At any rate they generate the derivative things—for example, the void, proportion, the odd, and other things of this sort—within the decad.<sup>1526</sup> For some things they assign to the starting-points—for example, movement, rest, good, bad—and the others to the numbers. That is why the odd is identified with the one, since if it was in the three, how could the five be odd?<sup>1527</sup>

[a12] Further, spatial magnitudes and all such things go up to a certain number—for example, there is the first, the indivisible, line, then two, then the rest up to ten.<sup>1528</sup>

[a13] Further, if number is separable, someone might raise a puzzle as to whether the one is prior, or the two or the three. Insofar, then, as the number is composite, the one is prior, but insofar as the universal and the form is prior, the number is prior.<sup>1529</sup> For each of the units is a part of the relevant number as its matter and the number is its form. And in a way the right angle is prior to the acute, because it is definite and because of its account, but in a way the acute is prior, because it is a part—that is, the right angle is divided into acute angles. As matter, then, the acute angle, the element, and the unit are prior, but as regards the form and the substance that is in accord with the account, the right angle, and the whole composed of the matter and the form, are prior.<sup>1530</sup> For what is both is closer to the form and to what the account is of, though posterior in coming to be.<sup>1531</sup> In what way, then, is the one a starting-point? Because it is not divisible, they say. But both the universal and the part or the element are indivisible, although they are starting-points in different ways, one in account and the other in time. In which of these ways, then, is the one a starting-point? For, as we said, the right angle seems to be prior to the acute, and the acute to the right, and each is *one*. They, then, make the one a starting-point in both ways. But this is impossible, since in one way it is a starting-point as form or substance, but in the other it is as part or as matter.<sup>1532</sup> For it is [only] *in a way* that each of the two is one, [since] in truth it is potentially (if, at any rate, the number is one and not like a heap, and if a distinct number is composed of distinct units, as they say) but not actually that each of the two is one.<sup>1533</sup>

And the cause of the error they fell into is that they were conducting their hunt [for starting-points] at the same time from the side of mathematics and from that of universal accounts. So from the former side they posited the one, the starting-point, as a point, since a point is a unit without position, and—just as some others have done—they put together beings from the smallest things.<sup>1534</sup> And so the unit becomes the matter of the numbers, and at the same time prior to the two—but also posterior, the two being treated as a whole, a one, and a Form.<sup>1535</sup> But because they were inquiring into the universal they treated the predicable one as also a part in this way. But these characteristics cannot belong at the same time to the same thing.<sup>1536</sup>

[a14] If, though, the one must merely be without position, since it differs in no way [from other ones] except that it is a starting-point, and the two is divisible but the unit is not, the unit would be more like the one-itself. But if the unit is more like it, then *it* would also be more like the unit than like the two. So each of the units [in the two] must be prior to the two. But this is something they deny—at any rate, they generate the two first.

[a15] Further, if the two-itself is a one and the three-itself is also a one, both together are a two. Of what, then, is this two composed?

## M 9

[a16] Someone might, though, raise a puzzle—since there is no contact in numbers but rather succession of units between which there is nothing (for example, between those in the two and in the three)—as to whether, these succeed the one-itself or not, and whether it is the two that is prior in succession or one of the units in it.

[a17] Similar difficulties also occur concerning the genera of things that are posterior to number—line, plane, and body. For some people generate these from the species (*eidōs*) of the great and the small—for example, lines from the long and short, planes from broad and narrow, and solids from deep and shallow (these being species of the great and small). And the starting-point that corresponds to the one different thinkers describe in different ways. And here, too, it is evident that there are innumerable impossibilities, and fabricated things, and things that are contrary to all reason. For [the species] are divorced from each other, unless indeed their starting-points mutually imply each other, so that the broad and narrow is also long and short. But if this is so, the plane will be a line and the solid a plane. Further, what account will be given of angles, figures, and things of this sort? For the same happens here as with number.<sup>1537</sup> For these [namely, long and

short] are attributes of magnitude, but magnitude is not *composed of* these, any more than the line is composed of straight and curved, or solids of smooth and rough.<sup>1538</sup>

[a18] Common to all these cases is just the same puzzle as arises in the case of the several species as species of a genus, when someone posits the universals, namely, whether it is the animal-itself that is in the particular animal or something other than animal-itself.<sup>1539</sup> If it is not separable, this produces no puzzle.<sup>1540</sup> But if the one and the numbers are separable, as those who hold these views say, then it is not easy to resolve the resulting puzzle—if we should say that the impossible is not easy. For when someone grasps with his understanding the one that is in the two, or in general in number, does he grasp the thing itself or something else?

[a19] Some people, then, generate spatial magnitudes from matter of this sort, whereas others do so from the point—the point, though, seems to them to be not one but something like the one—and from other matter, which is like plurality, but not plurality.<sup>1541</sup> About these, the same puzzles arise nonetheless. For if the matter is one, line and plane and solid will be the same, since what is composed of the same things will be one and the same. But if the matters are more than one and there is one for the line and a second for the plane and another for the solid, then either they imply each other or not, so that the same results will follow even so. For either the plane will not contain a line or it will *be* a line.

[a20] Further, in what way number can come from the one and plurality they make no attempt to explain.<sup>1542</sup> But whatever they say the same difficulties arise as for those who generate number from the one and the indefinite dyad.<sup>1543</sup> For while some generate number from the plurality that is predicated universally, not from a particular plurality, others generate it from a particular plurality, namely, the primary one (for the two is said to be a sort of first plurality). So there is (one might almost say) no difference, but instead the same puzzles will follow for mixture or position or blending or generation or other such things.<sup>1544</sup>

[a21] Most of all, however, we should inquire into what each unit is composed of, if it is one. For each unit is certainly not the same as the one-itself. It must, then, be composed of the one-itself and plurality, or a part of plurality. But to say that the unit is a plurality is impossible, because it is *indivisible*. If, on the other hand, it is composed from a part of plurality, there are many other difficulties. For each of the parts must be indivisible (or it will be a plurality and the unit will be divisible), and the elements will not be the one and *plurality*, since the single units are not composed of plurality and one.

[a22] Further, the holder of this view does nothing but introduce another number, since his plurality of indivisibles is a number.

[a23] Further, we must inquire also of those who speak in this way whether the number is unlimited or limited.<sup>1545</sup> For at the start, it seems, there was a limited plurality, of which, together with the one, the finite number of units are composed. But there is also another, plurality-itself, which is unlimited plurality. Which sort of plurality, then, is an element together with the one?

[a24] We might inquire similarly about the point, that is, the element from which they generate spatial magnitudes. For surely this is not the one point that alone exists. At any rate, we should ask what each of the other points is composed of. For of course it is not composed from some distance together with the point itself. But then there cannot be indivisible parts of a distance either, as there can be of the plurality that units are composed of. For number is composed of indivisibles, whereas spatial magnitude is not.

All these considerations, then, as well as others of the sort, make it evident that it is impossible for number and spatial magnitude to be separable. Further, the discord about numbers between the various versions is an indication that it is the things themselves not being truly grasped that produces the confusion in these versions. For those who make mathematical objects alone exist beyond the perceptibles, seeing the difficulty and the fabricated nature of the Forms, abandoned Form number and posited mathematical number. But those who wish to make the Forms at the same time also numbers, but did not see how, if someone posits these starting-points, mathematical number can exist beyond Form number, made Form number and mathematical number the same—in name, since in fact mathematical number has been done away with (for the hypotheses they state are special and unmathematical).<sup>1546</sup> But the one who first posited that Forms exist, that the Forms are numbers, and that the objects of mathematics exist, with good reason separated them. So it turns out that all these thinkers speak correctly on some issue, but on the whole are incorrect. And they themselves confirm this, since they do not say the same things, but contrary ones. The cause, though, is that their hypotheses and starting-points are false. And it is difficult, according to Epicharmus, to speak correctly from things grasped incorrectly, “since as soon as it is said, it is seen to be incorrect.”<sup>1547</sup>

Where numbers are concerned, then, the puzzles we have gone through and the distinctions we have drawn are enough. For while someone who is already convinced might be further convinced by more, someone not yet convinced would come no nearer to being convinced.

Concerning the primary starting-points and the primary causes and elements, however, some of what is said by those who speak only about perceptible substance has been discussed in our works on nature, while some does not belong to the present methodical inquiry.<sup>1548</sup> But what is said by those who assert that there are other substances beyond the perceptible ones is something we need to get a theoretical grasp on next after what we have just discussed. Since, then, some people say that the Ideas and the numbers are things of this sort, and that the elements of these are elements and starting-points of beings, we must investigate what they say and in what way they mean it.

Those who posit numbers only, and these mathematical ones, must be investigated later.<sup>1549</sup> Regarding those who accept the Ideas, however, we might well at the same time get a theoretical grasp on their version and on the puzzles they face. For they at the same time make the Ideas universal and contrariwise treat them as separable and as particulars. But that this is not possible is a puzzle that has been gone through before.<sup>1550</sup> The cause of the conjoining of these two characteristics in one and the same thing on the part of those who spoke of their substances as universals is that they did not make their substances the same as the perceptibles. They thought that the particulars in the realm of perceptible things were flowing and that none of them remains the same, but that the universal was both beyond these and something distinct from them. This, as we said in our previous discussion, was stirred up by Socrates, because of his definitions, but he did not *separate* these from the particulars—and he understood things correctly in not separating them.<sup>1551</sup> This is clear from the results. For without universals it is not possible to get scientific knowledge, but separating them is the cause of the subsequent difficulties regarding the Ideas. The others, though, supposing that if indeed there are going to be any substances beyond the perceptible and flowing ones, it is necessary for them to be separable, had no others, but set out the universal predicates, so that it followed that universals and particulars were pretty much the same natures.<sup>1552</sup> This in itself would be one difficulty for the view we have just described.

### M 10

Let us now discuss an issue that presents a certain puzzle both to those who accept the Ideas and those who do not, and which was stated before, at the start, when going through the puzzles.<sup>1553</sup> For if we do not posit substances to be separated, and in the way in which particular things are said to be separated, we will do away with the

sort of substance we wish to maintain. But if we posit substances to be separable, in what way should we posit their elements and starting-points to be?

[1] For if they are particular and not universal, [1a] there will be just as many beings as there are elements, and [1b] the elements will be scientifically unknowable. For [1a] suppose that the syllables in voiced sound are substances and that their elements are the elements of substances. Then there must be [only] one BA and one of each of the [other] syllables, if indeed they are not universal and the same in form, but rather each is one in number and a this something and not a thing that is the same in name [as something else]. (Besides, these thinkers posit the what-a-thing-is as being in each case one.<sup>1554</sup>) But if the syllables are this way, so too are the things they are composed of. There will not, therefore, be more A's than one, or more than one of any of the other elements either, based on the same argument on which, in the case of the syllables, there will not be more than one instance of the same one.<sup>1555</sup> But then if this is so, there will not be other beings beyond the elements, but only the elements.

[1b] Further, the elements will not be scientifically knowable either. For they are not universal, but scientific knowledge is of universals, as is clear from demonstrations and from definitions.<sup>1556</sup> For a deductive proof that this triangle has [its interior angles equal to] two right angles does not come about unless every triangle has [interior angles equal to] two right angles, nor that this human is an animal, unless every human is an animal.<sup>1557</sup>

[2] On the other hand, if the starting-points *are* universal, either the substances composed of them are also universals, or non-substance will be prior to substance.<sup>1558</sup> For the universal is not a substance, but the element or the starting-point is universal, and an element or starting-point is prior to the things of which it is an element or starting-point.

All these difficulties, then, follow quite reasonably, when these thinkers make the Ideas be composed of elements and also claim that beyond the substances that have the same form there are Ideas, [each of which] is a single separate thing. But if, as in the case of the elements of voiced sound, there is nothing to prevent there being many A's and B's without there being any A-itself or B-itself beyond the many, then, in view of this, there will be unlimitedly many similar syllables.

The fact that all scientific knowledge is universal, so that the starting-points of beings must also be universal and not separate substances, involves the greatest puzzle of those mentioned.<sup>1559</sup> But though there is surely a way in which what is said is true, there is another

15 way in which it is not true. For scientific knowledge, like knowing scientifically, is twofold, one potential, the other active: the capacity [or potential], being as matter, universal and indefinite, is of what is universal and indefinite, whereas the activity, being definite, is of what is definite—being a this something of a this something.<sup>1560</sup> But it is only  
20 coincidentally that sight sees universal color, because this [particular instance of] color that it sees is *a* color, and so what the grammarian theoretically grasps, namely, this [particular instance of] A, is *an* A.<sup>1561</sup>  
25 For if the starting-points must be universal, what comes from them must also be universal, as in the case of demonstrations.<sup>1562</sup> And if this is so, there will be nothing separable and no substance either. However, in one way scientific knowledge is universal, but in another it is not.



## BOOK NU (XIV)

### N 1

About this sort of substance, then, let what we have said be sufficient.

All thinkers make the starting-points contraries, as in natural things, so also in the case of the immovable substances. But if it is impossible for there to be anything prior to the starting-point of all things, the starting-point cannot be a starting-point by being another thing.<sup>1563</sup> This would be as if someone were to say that the white is a starting-point, not insofar as it is another thing, but insofar as it is white, yet that it is said of an underlying subject, and is white by being another thing. For then the underlying subject will be prior. But all things come to be from contraries as belonging to some underlying subject. An underlying subject, therefore, must be present above all in the case of contraries. All contraries, therefore, are always said of an underlying subject and none is separable. But just as it appears that nothing is contrary to substance, so too argument testifies to this.<sup>1564</sup> No contrary, therefore, is the starting-point of all things in the full sense, but there is another starting-point.

But these thinkers make one of the contraries matter, some making the unequal matter for the one, the equal, as if inequality were the nature of plurality, and another making plurality matter for the one.<sup>1565</sup> (The numbers are generated, for the former, from the dyad of the unequal, namely, the great and small, and, for the latter, from plurality, but for both they are generated by the substance of the one.<sup>1566</sup>) For even the thinker who says that the unequal and the one are the elements, and that the unequal is a dyad composed of the great and the small, speaks of the unequal or the great and the small as being one, and does not draw the distinction that they are one in account but not in number. But then these thinkers do not even give a correct account of the starting-points they call elements. Some speak of the great and the small along with the one, and treat these three as elements of the numbers, the dyad being matter, the one being the shape [or form].<sup>1567</sup> Others speak of the many and the few, because the great and the small are more appropriate in their nature to magnitude than to number. Others speak instead of the universal that is over these, namely, the excedder and the exceeded.

However, these variations make (one might almost say) no difference with respect to some of the consequences, but only with respect

to the logico-linguistic difficulties, which these thinkers take care to avoid, because the demonstrations they themselves carry out are logico-linguistic.<sup>1568</sup> Except that the very same argument that makes the excedder and the exceeded the starting-points, and not the great and the small, also makes number come from the elements prior to the two coming from them, since in both cases they are the more universal. As things stand, however, they accept one of these things but do not accept the other.

Other thinkers oppose the other and the another to the one, and others plurality to the one.<sup>1569</sup> But if, as they wish to maintain, beings are composed of contraries, and either there is nothing contrary to the one, or, if indeed there *is* going to be anything it is plurality, and if the unequal is contrary to the equal, and the other to the same, and the another to the thing itself, those who oppose the one to plurality have the view with most going for it. But even their view is inadequate, since the one will then be a few. For plurality is opposed to fewness and many to few.

It is evident, however, that the one signifies a measure. And in every case there is another thing, an underlying subject—for example, in a musical scale, it is a quarter-tone, in spatial magnitude, a finger or a foot or something else of the sort, in rhythms, a beat or a syllable, and similarly in weight, some standard weight. And in all cases it is the same way, in qualities it is a quality, in quantities a quantity. And the measure is indivisible, in kind (*eidōs*) for qualities and perceptually for quantities, as the one is not intrinsically substance of anything.<sup>1570</sup> And this stands to reason. For the one signifies the measure of some plurality, and number signifies a measured plurality and a plurality of measures. That is why it is quite reasonable for the one not to be a number, since *the* measure is not measures, on the contrary, what both the measure and the one are is a starting-point. The measure, though, must always be some self-same thing belonging to all [the relevant cases]—for example, if horse is the measure, to horses, and if human, to humans, and if human or horse or god, perhaps to living being, and the number of them will be a number of living beings. But if the things are human, pale, and walking, there will scarcely be a number of them, because they all belong to the same thing, which is one and the same in number—nonetheless, there will be a number of *kinds* (*genos*) of them, or of some other such term.

Those who posit the unequal as something that is one, but the dyad as an indefinite thing composed of great and small, make claims that are very far from being plausible or possible. For the latter are attributes and coincidents, rather than underlying subjects, of numbers

and magnitudes—the many and the few of number and the great and the small of magnitude—just like even and odd, smooth and rough, straight and curved.<sup>1571</sup>

Further, besides this error, the great and the small, and the other things of that sort, must be relative to something. But the relative, not its matter, is least of all a nature or substance, and is posterior to quality and quantity. Also, the relative is an attribute of quantity, as was said, not its matter, since another thing is [matter] for both the relative generally, and for its parts and kinds (*eidos*).<sup>1572</sup> For there is nothing either great or small, many or few, or, in general, relative to something, that is not great or small, many or few, or relative to something by being another thing.<sup>1573</sup>

An indication that the relative is least of all a substance and a being is that of it alone there is neither coming to be nor passing away nor movement, as with respect to quantity there is growth and withering, with respect to quality alteration, with respect to place spatial movement, with respect to substance simple coming to be and passing away.<sup>1574</sup> But with respect to the relative there are none of these. For, without being moved or changed, a thing will be now greater and now less or equal, if the other thing has moved with respect to quantity. Also, the matter of each thing, and so of substance, must be what is potentially that sort of thing. But the relative is neither potentially nor actively substance. It is absurd, then, or rather, impossible, to make what is not a substance an element in, and prior to, substance, since all the categories are posterior to substance.<sup>1575</sup>

Further, elements are not predicated of the things they are elements of, whereas many and few are predicated both separately and together of number, and long and short of line, and plane is both broad and narrow. If there is a plurality, then, of which the one term, namely, the fewness, is always [predicated], such as the two (for if it were many, one would be few), there must also be a plurality that is unconditionally many, such as the ten, if there is no number that is greater than it, or ten thousand.<sup>1576</sup> How, then, in view of this, can number be composed of few and many? For either both should be predicated of it, or neither. As things stand, however, only one or the other is.

## N 2

We must, though, investigate in an unconditional way whether eternal things can consist of elements, since then they will have matter. For everything that is composed of elements is composite. If, therefore, something that is composed of something, even if it always exists,

would of necessity, if it *had* come to be, also have come to be from it, and if everything that comes to be does so from something that is potentially what it comes to be (for it could not have come to be from something that did not have this potential nor could it be composed of it), and if what has this potential can be active or not, then however eternal number, or anything else that has matter, may be, it would admit of not existing, just like what lasts a single day and what lasts for so-and-so many years. But if this is so, then what has existed for so long a time that it has no limit admits of not existing too. Things that consist of elements, therefore, cannot be eternal, if indeed what admits of not existing is not eternal, as we have had occasion to busy ourselves showing in another discussion.<sup>1577</sup> If, however, what we are now saying is true universally, namely, that no substance is eternal if it is not an activity, and if the elements are matter of what is a substance, then no eternal substance can be composed of elements present in it.<sup>1578</sup>

But there are some people who make the element that is together with the one an indefinite dyad, and object to the unequal, quite reasonably, because of the impossible consequences.<sup>1579</sup> But they get rid only of those difficulties that necessarily follow as a result of making the unequal and the relative an element. But these people must also face those difficulties that arise separately from this notion, whether it is Form number they produce from these elements or mathematical number.

There are many causes, to be sure, which led these thinkers astray in the case of these causes, but especially the fact that they raised the puzzle in an archaic way.<sup>1580</sup> For they believed that all beings would be one, namely, Being-itself, if they did not resolve—and so traveled to the same place as—the argument of Parmenides: “For never will this prevail, that things that are not, are.”<sup>1581</sup> Hence they thought it necessary to show that not being is, since only in this way, namely, from being and something else, could beings be composed, if they are many.

However, in the first place, if being [is said of things] in many ways (for it signifies sometimes substance, sometimes quality, sometimes quantity, and at other times the other categories), what sort of one, then, will all beings be, if there is no not being?<sup>1582</sup> Will it be substances, or qualities, and the others likewise? Or will they all be one—the this, the of such-and-such sort, the so-and-so much, and the others that signify one something? But it is absurd—or, rather, impossible—for a single sort of nature to become the cause of a being’s being a this, being of such-and-such sort, being so-and-so much, and being in a place.

Second, of what sort of not being and being will the beings be composed? For not being [is said of things] in many ways too, since

being is, and not being a human signifies not being a this, not being straight signifies not being of such-and-such sort, not being three cubits signifies not being so-and-so much. Of what sort of being and not being, then, are beings composed so as to be many? *He* means the false and calls that sort of nature not being, of which, together with being, beings are composed so as to be many.<sup>1583</sup> That is why it also used to be said that something false must be assumed, as geometers assume what is not a foot long to be a foot long. But this cannot be so. For geometers do not assume anything false, either, since it is not a premise of the deduction, nor is it not being in this sense that beings come to be from or pass away into.<sup>1584</sup> But since there are as many cases in which things are said not to be as there are categories, and beyond these the false is said not to be, as is what is potentially, it is from this last one that there is coming to be, human from what is not human but is potentially human, white from what is not white but is potentially white, and similarly whether it is one thing that comes to be or many. 20 25 30

It is evident, though, that their inquiry is how being in the sense of substance can be many, since the things that come to be [in their view] are numbers and lines and bodies. Yet it is absurd [for them] to inquire how being in the sense of the what-it-is can be many, but not how quality or quantity can be. For surely the indefinite dyad or the great and the small is not a cause of there being two whites, or many colors, or flavors or shapes, since then these too would be numbers and units.<sup>1585</sup> But then if they *had* approached these issues, they would have seen what the cause is in the case of substances too, since the cause is the same or analogous.<sup>1586</sup> 35 1089<sup>b</sup>1

In fact, this deviation is also what causes them—when they were inquiring into the opposite of being and the one (from which, together with these, beings are composed)—to posit the relative or the unequal, which is neither the contrary nor the contradictory of these, but one nature of beings, just like the what [-it-is] and quality. 5

They should have also inquired about this, namely, how relatives are many and not one. But as things stand, they inquire how there can be many units beyond the primary one, but do not proceed to inquire how there can be many unequals beyond *the* unequal. And yet they make use of them and speak of great and small, many and few (from which the numbers are composed), long and short (from which the line is composed), broad and narrow (from which the plane is composed), and deep and shallow (from which the solids are composed), and they mention yet more kinds (*eidos*) of the relative. What is the cause, then, of these being many? 10

15 It is necessary, then, as we say, to assume for each thing what it is potentially. But the thinker who stated the previous things went on to declare what it is that is potentially a this and a substance but is not a being intrinsically, namely, that it is the relative (this is just as if he had said the qualitative), which is not potentially the one or being, nor the negation of the one or of being, but instead one of the beings.  
 20 And so it was much more necessary, as we said, if he was inquiring how beings are many, not to inquire into those in the same category—how there are many substances or many qualities—but how *beings* are many, since some of them are substances, some qualities, and some relations.

25 In the case of the other categories there is something else to give us pause about how there can be many. For because they are not separable it is by their underlying subject's coming to be many and being many that both qualities and quantities are many. And yet there must, surely, be a matter for each category (*genos*), except it cannot be separable from substances.<sup>1587</sup>

30 In the case of this somethings, however, it [matter] is a reason why the this something can be many—unless there is a thing that is both a this something and a nature such as this.<sup>1588</sup> The puzzle here is rather this, how there can be many active substances and not one.<sup>1589</sup>

35 But again if the this and quantity are not the same, it is not said how and why beings are many, but rather how quantities are many. For all number signifies a quantity of some sort, and so does the unit, unless it signifies a measure or the quantitatively indivisible.<sup>1590</sup> If, then, quantity and the what-it-is are distinct, it is not said what the what-it-ises are composed of or how they can be many, and if someone says they are the same, there are many inconsistencies he has to face.

1090\*1 We might also focus the investigation concerning numbers on the question of where we should get the conviction that they exist from.<sup>1591</sup> To the thinker who posits Ideas they provide some sort of cause for beings, if indeed each number is a certain Idea, and the Idea is for the other things in some way or other the cause of their being (for let us grant them this assumption). But what about the one who does not think in this way, because of seeing the difficulties about Ideas inherent in it (so that *this* is not why he posits numbers), but who does posit mathematical number—where should we get the belief that this sort of number exists from, and of what use is it for the other things? For there is nothing that the thinker who claims this says that it causes (he rather says that it is a sort of intrinsic nature).<sup>1592</sup> Nor is it evident that it is the cause of anything. For the theorems of the arithmeticians will all apply  
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 15 equally well to perceptible things, as we have said.<sup>1593</sup>

## N 3

Those, then, who posit that the Ideas exist and that they are numbers, in virtue of setting out each thing beyond the many and taking each to be one, try at least to say in a way why number exists.<sup>1594</sup> Since, however, the things they say are neither necessary nor possible, we should not—because of these things, at any rate—say that number exists. The Pythagoreans, on the other hand, because they saw many of the attributes of numbers to belong to perceptible bodies, made beings be numbers—not separable numbers, however, but they made beings be composed of numbers.<sup>1595</sup> Why so? Because the attributes of the numbers are present in a musical scale and in the heaven and in many other things.<sup>1596</sup> Those, however, who say that mathematical number alone exists cannot, in accord with their hypothesis, say anything of this sort. Instead, it used to be said [on their behalf] that there cannot be sciences of these [perceptible things]. But we claim that there are, as we said earlier.<sup>1597</sup> And it is clear that the objects of mathematics are not separate. For if they were separate their attributes would not be present in bodies. Now in this regard the Pythagoreans are open to no objection, but in that they make the natural bodies be composed of numbers, things with lightness and weight be composed of things that have neither lightness nor weight, they seem to be speaking of another heaven and of other bodies but not of the perceptible ones. Those, though, who make number separable, take it to exist and be separable on the grounds that the axioms will not be true of perceptibles, whereas [mathematical] statements are true and gladden the soul; and similarly with mathematical magnitudes.<sup>1598</sup> It is clear, then, that the contrary account will say the contrary, and that the puzzle just raised, as to why, if numbers are in no way present in perceptibles, their attributes are present in perceptibles, has to be resolved by those who say these things.

There are some people, though, who, because the point is the limit and extremity of the line, the line of the plane, and the plane of the solid, think that there must be natures of this sort. We must, then, examine this account too, and see whether it is not exceedingly weak. For *substances* the extremities are not, but all these are instead limits. For even of walking, and of movement in general, there is a limit, so that it would be a this something and a certain substance. But that is absurd.<sup>1599</sup> But even if they are substances, they will all be among the perceptibles, since it was to these that the account applied. Why then will they be separable?

Further, if we are not exceedingly indifferent to suffering, we might press the inquiry regarding all number and the objects of mathematics,

that they make no contribution to each other, the prior to the posterior. For if number did not exist, nonetheless spatial magnitudes would exist for those who maintain the existence only of the objects of mathematics, and if spatial magnitudes did not exist, soul and perceptible bodies would exist.<sup>1600</sup> But nature does not seem, on the basis of the appearances, to be episodic, like a bad tragedy.

As for those who posit the Ideas, this criticism misses them. For they produce spatial magnitudes from matter and number, lengths from the two, planes presumably from three, and solids from the four, or from other numbers as well—it makes no difference. But will these magnitudes be Ideas, or what way do they exist? And what do they contribute to beings? In fact, nothing—just like the objects of mathematics, they contribute nothing. But then no theorem even applies to them either, unless we wish to change the objects of mathematics and produce some special notion of our own.<sup>1601</sup> It is not difficult to assume any hypotheses whatever and go on at great length stringing things together. These thinkers, then, are in error in striving to unite the objects of mathematics with the Ideas in this way.

And neither of those who first posited two sorts of numbers, Form number and mathematical number, have said or can say in what way mathematical number exists or what it is composed of. Indeed, they make it an intermediate between Form number and perceptible number.<sup>1602</sup> For if it is composed of the great and the small, it will be the same as the other—the Ideal [or Form]—number, and from what other small and great does he produce magnitudes? If, though, he names some other one, the elements he names will be many.<sup>1603</sup> Also, if the starting-point of each of them is a one, the one will be something common to these, and we must inquire how the one can be this many things, while at the same time number cannot, according to him, be generated except from the one and an indefinite dyad.

All this, then, is absurd, and conflicts both with itself and with what is reasonable, and we seem to see in it the “long story” of Simonides.<sup>1604</sup> For a long story, like the [excuse] of slaves, comes about when people have nothing sound to say. And the very elements—the great and the small—seem to object loudly to being dragged in, since they cannot in any way generate number except what is got from [the] one by two-making.<sup>1605</sup>

It is absurd, too, to posit a coming to be of things that are eternal—or, rather, it is one of the things that are impossible. And there should be no doubt about whether the Pythagoreans do or do not posit their coming to be. For they say plainly that when the one had been



composed, whether of planes, of surface, of seed, or of something they are at loss to describe, immediately the closest part of the unlimited began to be constrained and limited by the limit.<sup>1606</sup> But since they are engaged in world-making and wish to speak like physicists, it is fair to examine them somewhat on what they say about nature, but to leave them out of the present methodical inquiry. For we are examining the starting-points that are in the immovable things, so that it is numbers of this sort whose coming to be we must investigate.

## N 4

They say that there is no coming to be of the odd, clearly implying that there is coming to be of the even.<sup>1607</sup> As for the even, some present it as the first thing to come from unequals—the great and the small—when these are equalized. The inequality, then, must belong to them prior to their having been equalized. If they had always been equalized, they would not have been unequal prior to that. For there is nothing prior to what has always been. So it is evident that they are not positing the coming to be of the numbers [merely] for the sake of getting a theoretical grasp on them.<sup>1608</sup>

It is a puzzle, however, and a reproach to being in a puzzle-free condition, as to how the elements and the starting-points are related to the good and the noble.<sup>1609</sup> The puzzle is this, whether any of the elements is the sort of thing we mean by the good-itself and the best good, or whether this is not so, but these are later in their coming to be than the elements.

The theologians seem to agree with some thinkers of the present day who say no—rather, it is only when the nature of beings has progressed that both the good and the noble make their appearance.<sup>1610</sup> (They do this to avoid a real difficulty that confronts those who say, as some do, that the one is a starting-point. The difficulty arises, however, not because they ascribe the good to their starting-point as an attribute, but because they make the one a starting-point—and a starting-point in the sense of an element—and generate number from the one.) The early poets agree with this same view, insofar as they say that it was not the first things that reigned and ruled (for example, night and heaven or chaos or ocean), but Zeus.<sup>1611</sup> But then they were led to say these things because they think of the rulers of the beings as changing. Although those of them whose works are a mixture, in that not everything is stated in a mythological way—for example, Pherecydes, as well as some others—make the primary generator be the best good, as do the Magi and some of the later wise men, such as both Empedocles and

Anaxagoras, the former making love (*philia*) an element and the other making [divine] understanding a starting-point.<sup>1612</sup> Of those, though, who assert the existence of the immovable substances, some say that the one-itself is the good-itself, but they thought its substance to be most of all its oneness.

15 This, then, is the puzzle, which of the two ways of speaking should we adopt? But it would be absurd if to what is primary, eternal, and most self-sufficient this very thing—self-sufficiency and preservation—belongs primarily in some other way than *as a good*. But then it is not because of anything other than its good state that it is incapable of passing away or being self-sufficient.<sup>1613</sup> So to say that the  
20 starting-point is like this is quite probably true. But for it to be the one or, if not that, at any rate an element, and an element of numbers, is impossible. For great difficulties result (to avoid which some have renounced the view, namely, those who agree that the one is a primary starting-point and element, but only of *mathematical* number).<sup>1614</sup> For each unit becomes just what is a sort of good, and there  
25 is a great abundance of goods.<sup>1615</sup> Further, if the Forms are numbers, each of the Forms will be just what is a sort of good. But let someone posit Ideas of anything he wishes, since if these are Ideas only of goods, the Ideas will not be substances, whereas if the Ideas are also of substances, then all animals, plants, and all the participants in an Idea will be good.

30 These absurdities follow, then, and it also follows that the contrary element, whether plurality or the unequal, that is, the great and small, is the bad-itself (which is why one thinker avoided attaching the good to the one, because it would necessarily follow, since coming to be is from contraries, that the bad would be the nature of plurality, whereas  
35 others say that inequality is the nature of the bad).<sup>1616</sup> It follows, then, that all beings participate in the bad except one, namely, the one-itself, and that numbers participate in it in a more undiluted way than spatial magnitudes, and that the bad is the place of the good, and that it participates in and desires what is destructive of it.<sup>1617</sup> For contrary is destructive of contrary. And if, as we were saying, the matter is what is potentially a given thing (for example, the matter of what is actively fire is what is potentially fire), then the bad will itself be potentially  
1092<sup>a</sup>1 good.<sup>1618</sup>

5 All this follows, then, partly because they make every starting-point an element, partly because they make contraries be starting-points, partly because they make the one a starting-point, partly because they make the numbers the primary substances, and make them separable and Forms.

## N 5

If, then, it is equally impossible not to put the good among the starting-points and to put it there in this way, it is clear that the account of the starting-points and of the primary substances has not been correctly given. Nor is someone correct in his assumption when he compares the starting-points of the whole to that of animals and plants, on the grounds that the more complete always comes from the indefinite and incomplete, and is led by this to say that it also holds of the primary starting-points, so that the one-itself is not even a being.<sup>1619</sup> For even here the starting-points from which these things come are complete, since it is a human who begets a human, and the seed is not primary.<sup>1620</sup>

And it is absurd to generate place at the same time as the mathematical solids. For place is special to particular things, which is why they are separable by place, whereas the objects of mathematics are not anywhere. It is also absurd to say that the mathematical solids must be somewhere, but not to say what this place is.

People who say that beings come from elements and that the primary beings are the numbers should have said in which way number comes from the starting-points as follows, namely, by distinguishing the ways in which one thing comes from another.<sup>1621</sup> Is it by mixture? But not everything is mixable; what is produced is something distinct; and the one will not remain separate and a distinct nature, which they wish it to be.<sup>1622</sup> By mode of combination, like a syllable? But then the elements must have position, and the person who understands the one and the plurality will understand them separately.<sup>1623</sup> This, then, is what number will be—unit plus plurality, or the one and the unequal.

Also, since coming from certain things means in one way that they are still present as components, and in another way that they are not, which way holds of numbers? For the case in which they are present as components is possible only for things that come to be.<sup>1624</sup> Is it, then, in the way that things come from seed? But nothing can come away from what is indivisible.<sup>1625</sup> From a contrary that does not persist? But everything that comes to be in this way also comes to be from something else that does persist.<sup>1626</sup> Accordingly, since one thinker posits the one as contrary to the plurality, and another (treating the one as equal) as contrary to the unequal, number must be taken to come from contraries. There is, then, something else that persists, from which, together with the other of the two factors, number is or has been generated.<sup>1627</sup>

Further, why on earth do other things that come from contraries, or that have contraries, pass away (even when they come from all of it), whereas number does not? Nothing is said about this.<sup>1628</sup> Yet whether

present as component or not present as a component a contrary always destroys [its contrary], just as strife destroys mixture (yet it *should not* have done so, since that is not its contrary).<sup>1629</sup>

Nothing, on the other hand, has been determined at all about the way in which the numbers are the causes of substances and of being. Is it as boundaries (as points are of spatial magnitudes) and as Eurytus assigned a certain number to belong to a certain thing (for example, one number to human and another to horse), by using pebbles to copy the shape of living things, as some people put numbers in the shapes of a triangle or a square?<sup>1630</sup> Or is it because harmony is a ratio of numbers, and so is human and each of the others? But the attributes—the white and sweet and the hot—how are *they* numbers? For that the numbers are neither a thing's substance nor causes of its shape [or form] is clear. For the ratio is the substance, whereas the number is the matter.<sup>1631</sup> For example, the substance of flesh or bone is number in this way, namely, three parts of fire and two of earth.<sup>1632</sup> And a number, whatever number it is, is always a number of something, of fire or earth or units. The substance, by contrast, consists in there being so-and-so much of one thing to so-and-so much of another in the mixture. And this is no longer a number but a ratio of a mixture's numbers, whether corporeal or of some other sort.

Number, then, is not a cause by producing things (whether number in general or number composed of abstract units), nor matter, nor a ratio and form of things. But then it is not the cause as the for-the-sake-of-which either.<sup>1633</sup>

## N 6

We might, though, raise a puzzle about what the good is that things get from the numbers by the fact that their mixture is expressible by a number, whether easily calculable or odd.<sup>1634</sup> For as things stand honey-water is no more healthy if it is mixed in the proportion of three times three, on the contrary, it would be more beneficial if it were mixed in no particular ratio, but were watery, than if it were in a numerically expressible one, but were strong.<sup>1635</sup>

Further, the ratios of mixtures are expressed by the *adding* of numbers, not merely by numbers—for example, it is three parts to two, not three times two. For in multiplications the factors must be of the same kind (*genos*), so that the product of  $1 \times 2 \times 3$  must be measurable by 1, and  $4 \times 5 \times 6$  by 4, and so all [products of the same factor] must be measurable by that factor. The number of fire, then, cannot be  $2 \times 5 \times 3 \times 6$  and that of water  $2 \times 3$ .<sup>1636</sup>

If all things must share in number; though, it must follow that many things are the same, and that the same number must belong to one thing and also to another. Is the number the cause, then, and is it why the thing exists, or is this unclear? For example, there is a number proper to the spatial movements of the sun, as again to those of the moon, as well as to the life expectancy and prime, indeed, of each of the animals. What, then, is to prevent some of these numbers from being squares, some others cubes, and some equal, others double? In fact, there is nothing to prevent it. Instead, all things must turn and change within these limits, if all things share in number. And it was also possible for different things to fall under the same number, so that if things happened to have the same number, they would be the same as each other, because of having the same form (*eidōs*) of number—for example, the sun and the moon would be the same.

But why are these numbers causes? There are seven vowels, the scale consists of seven strings, the Pleiades are seven, at seven animals lose their teeth (some do, at least, some do not), and there were seven heroes against Thebes. Is it then because of the nature of such a number that the heroes were seven or that the Pleiades consists of seven stars? Surely, the heroes were seven because there were seven gates or due to some other cause, and while we count the Pleiades as seven and the Bear as twelve, others count more stars in them.

They even say that the letters *xi*, *psi*, and *zeta* are concords, and that there are three of these [double consonants] because there are three concords. They do not care at all that there might be a thousand such letters, since, for example, one symbol might be assigned to *gamma* and *rho* together. But if they reply that each of these three is equal to two of the other letters, while none of the others is, and the cause of this is that there are three regions of the mouth and one letter is applied to *sigma* in each, then it is because of this that there are only three, not because there are three concords, since there are in fact more than three, but there cannot be more than three double consonants.<sup>1637</sup>

These people, then, are like the early Homeric scholars, who see small resemblances but overlook large ones.<sup>1638</sup>

Some further say that there are many such cases—for example, that the middle strings are nine and eight, that the epic verse has seventeen syllables, which is equal in number to these strings, and that the line scans in the right [or first] half with nine syllables, and in the left [or second] with eight.<sup>1639</sup> And they say that the distance in letters from *alpha* to *omega* is equal to that from the lowest note of the flute to

1093<sup>a1</sup>

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1093<sup>a1</sup>

the highest, and that its number is that of the whole system of the heaven.<sup>1640</sup> It must be observed, however, that no one should be at a loss to state or to discover such resemblances in eternal things, since they can be found even in things that pass away.

On the other hand, the celebrated natures of the numbers and their contraries, and those in mathematics generally, as some people describe them and make them causes of nature, seem, when we investigate them in this way, to vanish. For none of them is a cause in any of the ways that were distinguished with respect to the starting-points.<sup>1641</sup> In a way, however, they make it evident that the good does belong here, and that the odd, the straight, the square, the powers of certain numbers, are in the column of the noble.<sup>1642</sup> For the seasons and a certain sort of number go together, and all the other examples that they collect together on the basis of mathematical considerations have this force. That is why they seem like chance occurrences. For they are indeed coincidences (although they all properly belong with each other), but are one by analogy. For in each category of being there is something analogous—as the straight is in length, so in surface is the level, and perhaps, in number the odd, and in color the white.<sup>1643</sup>

Further, it is not the Form numbers that are the causes of harmonic relations and the like (for equal Form numbers differ from each other in form, since even their units do), and so we do not have to posit Forms because of this at any rate.<sup>1644</sup>

These, then, are the consequences [of the account], and yet more might be adduced. And the fact that these thinkers have such a hard time with the generation of the numbers and are incapable of stringing things together in any way at all seems to be a sure indication that the objects of mathematics are not separable from perceptibles, as some say, and that the starting-points are not these.

## Notes

### BOOK ALPHA (I)

#### Note 1

**All humans by nature desire to know:** The comparable claim that “a human is by nature a political animal” (*Pol.* I 1 1253<sup>a</sup>2–3) means, in part, that “an impulse toward this sort of community exists by nature in everyone” (2 1253<sup>a</sup>29–30)—nature and impulse (*hormê*) are again associated at  $\Delta$  23 1023<sup>a</sup>9. So presumably the desire to know need not be understood as one that all humans are either conscious of having or act on. It may exist simply as an impulse or conatus, which, granted leisure and the various cultural developments needed for it (981<sup>b</sup>20–23), will find expression in human life. See also  $\Lambda$  1074<sup>b</sup>11–14n.

**By nature (*phusei*):** (1) Many of the things Aristotle means by *phusis* (“nature”) are discussed in  $\Delta$  4. But he uses the term more widely than that discussion suggests. In the “primary and full way” a being that is or does something by nature has a nature, which is an internal starting-point of movement and rest ( $\Delta$  4 1015<sup>a</sup>13–15). The world of nature, investigated by natural science, is a world of such beings, all of which have perceptible matter as a constituent (*E* 1 1025<sup>b</sup>30–1026<sup>a</sup>6). This world is roughly speaking the sublunary one. Beyond it lies the world of the heavens studied by astronomy and theology (1026<sup>a</sup>7–22), where beings have either no matter or matter of a different sort (*Z* 2 1028<sup>b</sup>15n, 10 1036<sup>a</sup>9–12). Although, strictly speaking, these beings do not have natures, Aristotle nonetheless speaks of them as if they do (1026<sup>a</sup>20, 25 are nice—because particularly unfortunate—examples). We use the term “nature” in a similar way when we speak of the nature of the numbers or the nature of fictional entities, not meaning to imply at all that these things are parts of the natural world (compare *M* 4 1078<sup>a</sup>10). (2) Sometimes, instead of using *phusis* to refer to the or a *phusis* of *X*, Aristotle uses the term and its plural *phuseis* to mean something we translate as “a nature” (Greek has no indefinite article) or “natures.” The thing or things referred to may or may not have natures in the strict sense; they may be just entities of some sort. (3) Aristotle also speaks of *phusis* or *hê phusis* in agentive terms—for example, when he says, as he frequently does, that nature does nothing pointlessly (for example, *DA* II 5 415<sup>b</sup>16–17, III 9 432<sup>b</sup>21, 12 434<sup>a</sup>31, *PA* I 1 641<sup>b</sup>12–29). Just as when he speaks of “the nature of the whole,” it is not entirely clear how exactly or how literally these words are to be taken ( $\Lambda$  10 1075<sup>a</sup>11n).

#### Note 2

**An indication of our natural desire to know is our liking for the perceptual capacities (*aisthêsôn*):** Aristotle sometimes uses the noun *aisthêsis* to refer to (1) the

activity of perceiving some perceptual object, and sometimes to (2) the perceptual capacities (or senses). His use of the plural, and what he goes on to say, make it more likely that he has (2) in mind, as at 980<sup>a</sup>28 and 981<sup>b</sup>14.

### Note 3

**The one because of the eyes** (*hê dia tôn ommatôn*): Since it is perceptual capacities not perceptions that are under discussion, the phrase *hê dia tôn ommatôn* refers not to a perception we get “through” (another meaning of *dia*) the eyes, but to the perceptual capacity (sight) we have because we have eyes (the organ of sight). Hence at *Sens.* I 437<sup>a</sup>5–7 it is “the capacity of sight” that “reports many multifarious differences, because all bodies have a share of color.”

### Note 4

**The cause of this is that of all perceptual capacities it enables us to know most fully and makes clear many differences:** Nonetheless, it is in the exactness or discrimination of their touch, not their vision, that humans exceed other animals: “It would seem, indeed, that while smell is analogous to taste, and similarly the kinds (*eidos*) of flavor to those of odor, human taste is more exact because it is a sort of touch, and that perceptual capacity is most exact in a human being. For in the others he is inferior to many animals, but in touch he is much more exceedingly exact than the rest. That is why he is also the most intelligent of the animals. An indication of this is that members of the human race (*genos*) are naturally well-disposed or naturally ill-disposed depending on this perceptual organ and on no other, since the hard-fleshed ones are naturally ill disposed for thought, whereas the soft-fleshed ones are well-disposed” (*DA* II 9 421<sup>a</sup>18–26).

**Cause** (*aition*): The difference between *aition* (neuter), used here, and *aitia* (feminine), which is also often used, is that an *aitia* is an explanatory argument (a type of deduction) that identifies causes, whereas an *aition* is an item in the world that is causally efficacious. Aristotle does not systematically observe the distinction, but it is *aitia* that figures in his definitions of craft knowledge and scientific knowledge (*APo.* I 2 71<sup>b</sup>9–12, II 11 94<sup>a</sup>20–27). Both *aition* and *aitia* are translated as “cause.”

**Knowledge** (*gnôsis*; verb, *gignôskein*): Although there may be little difference between *gnôsis* and *epistêmê* (verb, *epistasthai*), *epistêmê* is usually applied only to demonstrative sciences, crafts, or other bodies of systematic knowledge, so that *epistêmê* is specifically scientific knowledge. *Gnôsis* is weaker and is used for perceptual knowledge and knowledge by acquaintance—something familiar is *gnôrimos*. If X knows that p, it follows that p is true and that X is justified in believing it. Similar entailments hold in the cases of *epistasthai* and *eidenai* (used in the opening sentence) but may not hold in that of *gignôskein*.

**Differences** (*diaphoras*): The noun *diaphora* sometimes refers to the differentia which, together with a genus, makes up the scientific definition of an animal species or the like. Here, however, as often elsewhere, it is used in a more general sense.

### Note 5

**Animals are born possessed of perception:** In fact, all animal souls essentially possess two capacities, which must occur together (*DA* II 2 413<sup>b</sup>23–24), one “to discern things and the other to cause movement with respect to place” (III 9 432<sup>a</sup>15–17).



A soul possesses the capacity of discernment, first, by having a “perceptual part (*aisthêtikon*)” (III 9 432<sup>a</sup>30), responsible for perception proper and various other functions, such as imagination. In the case of humans, this part consists of the *primary perceptual part*, located in the heart, as well as the various special perceptual capacities—sight, smell, hearing, taste, touch—and the common perceptual capacity. The part responsible for movement is the desiring part (*orektikon*). It consists of appetites, such as hunger and thirst, as well as other desires and emotions of various sorts, which cause movement or action by being modes of receptivity or responsiveness to aspects of reality discerned as pleasant or painful or, in some other way, good or bad, end-furthering or end-frustrating (III 7 431<sup>b</sup>8–10).

#### Note 6

**In some of them, memory does not come about from this, but in others it does come about:** “Memory is not perception or supposition, but a state or affection connected with one of these, when time has elapsed. . . . And that is why all memory involves time. So only animals that perceive time remember, and they do so by means of that with which they perceive [namely, the primary perceptual part and imagination, which belongs to it]. . . . And it is not possible to understand without an appearance (*phantasmatos*) [= an object of imagination]. . . . So memory will belong to thought coincidentally, but intrinsically to the primary perceptual part. And that is why some other animals too have memory, and not only humans and those animals that have belief or practical wisdom. But if memory were one of the understanding parts, not many of the other animals would have it, and perhaps no mortal animal would have it, since even as things stand they do not all have memory, because they do not all have perception of time. For when someone is activating his memory . . . , he perceives in addition that he saw this, or heard it, or learned it earlier; and the earlier and the later are in time. It is evident, then, to which part of the soul memory belongs, namely, the very same part as that to which imagination belongs. And it is appearances [= objects of imagination] that are remembered intrinsically, whereas things that are not grasped without appearances are remembered coincidentally” (*Mem.* 1 449<sup>b</sup>24–450<sup>a</sup>25).

#### Note 7

**Practically-wise** (*phronimôtera*): *Phronêsis* (verb *phronein*) is used: (1) in a broad sense to refer to thought or (roughly speaking) intelligence of any sort (as at *Γ* 5 1009<sup>b</sup>13, 30); (2) in a narrower sense to refer to the distinctively practical wisdom discussed in *NE* VI 5; and (3) as equivalent in meaning to *sophia* or theoretical wisdom (*M* 4 1078<sup>b</sup>15, and throughout *Protr.*). (2), in its fullest form, and (3) are distinctively human possessions. But Aristotle does sometimes attribute a weaker form (*HA* VII 1 588<sup>a</sup>18–31) of (2) to non-human animals, such as deer, hare, cranes, bees, and ants (*I* 2 488<sup>b</sup>15, *IX* 5 611<sup>a</sup>15–16, *IX* 10 614<sup>b</sup>18, *PA* II 2 648<sup>a</sup>5–8, 4 650<sup>b</sup>18–27, *GA* III 2 753<sup>a</sup>10–17).

#### Note 8

**Kind** (*genos*): The various ways in which the noun *genos* is used are discussed in *Δ* 28. Aristotle uses it in a technical sense to refer to a genus, which is studied by a single science, as he uses *eidos* to refer to a species of a genus, to form (as opposed

to matter), and to a separate Platonic Form. But he also uses both terms in a more general sense to mean "kind." When this is so transliterations are added for precision. See also 980<sup>a</sup>27n on *diaphora*.

**Can be taught:** "The perceptual capacities that operate through external media, such as smell, hearing, and sight, are characteristic of animals capable of movement. In all that have them they exist for the sake of preservation, in order that they may perceive their food before they pursue it, and avoid what is bad or destructive, while in those that also happen to have practical wisdom (*phronêseôs*), they exist for the sake of doing well, since they make us aware of many differences, from which arises practical wisdom concerning both intelligible things and things doable in action. Of these, sight is intrinsically superior as regards the necessities of life, while hearing is coincidentally so as regards understanding (*nous*). For the different qualities that the capacity of sight reports are many and multifarious because all bodies are colored, so that it is to the highest degree by this perceptual capacity that the common perceptibles are perceived (I mean, figure, magnitude, movement, and number), whereas hearing reports only differences in sound, and in a few cases differences in voice too. Coincidentally, however, it is hearing that plays the biggest part as regards practical wisdom. For speech (*logos*) is a cause of learning, not intrinsically, but coincidentally; for it consists of words, and each of the words is a symbol. Because of this, of those who have been deprived from birth of one or other of these perceptual capacities, the blind are more practically-wise than deaf mutes" (*Sens.* 1 436<sup>b</sup>18–437<sup>a</sup>17). Not all animals that possess voices, though, are capable of speech: "It is also clear why a human is more of a political animal than any bee or any other gregarious animal. For nature does nothing pointlessly, as we say, and a human being alone among the animals has speech. Now, the voice is an indicator of what is pleasant or painful, which is why it is also possessed by the other animals (for their nature does extend this far, namely, to having the perception of pleasure and pain and indicating them to each other). But speech is for making clear what is advantageous or harmful, and so also what is just or unjust. For this is special to humans, in comparison to the other animals, that they alone have perception of the good and the bad, the just and the unjust, and the rest. And it is community in these that makes a household and a city" (*Pol.* I 2 1253<sup>a</sup>7–18).

## Note 9

**Appearances** (*phantasiai*): An appearance (*phantasia*, *phantasma*) is similar to a perceptual content, but can be retained in imagination (also *phantasia*) even when perception of the object is no longer taking place: "Appearances are like perceptions (*aisthêmata*), except without matter" (*DA* III 8 432<sup>a</sup>9–10). The final clause "except without matter," means "without the imprint made on the matter of the relevant perceptual capacity by the material component of object making it." The shape of the ring is imprinted on the matter but not the gold from which it is made.

**Craft knowledge** (*technê*): A craft is a science concerned with production rather than action or contemplation. See Z 7 1032<sup>a</sup>26–1032<sup>b</sup>31, *NE* VI 4.

**Rational calculations** (*logismois*): Rational calculation (*logismos*), of which deliberation (*bouleusis*) is a variety, is the function of the calculative or deliberative part (*logistikôn*, *bouleutikôn*) of the soul, of which practical wisdom is the virtue

and action the primary focus (NE VI 1 1139<sup>a</sup>11–17, 5 1140<sup>a</sup>24–28). Humans live by craft knowledge when production is their aim, by practical wisdom when their aim is action (4 1140<sup>a</sup>1–6). Sometimes calculation is a matter of measuring or counting, as when people use pebbles to calculate such things as the produce tax on animals (SE 1 1 165<sup>a</sup>9–10, Oec. II 1348<sup>a</sup>23), but more often, as here, it is a matter of reasoning or constructing arguments of the sort that might bear on practical questions to which no craft or science provides an explicit answer (Top. VI 6 145<sup>b</sup>16–20, Rh. I 2 1357<sup>a</sup>1–4, NE VI 5 1140<sup>a</sup>28–30). Hence it is often coupled with inquiry (*zêtêsis*), either as the means it employs or as the embodiment and justification of its outcome (MA 7 701<sup>a</sup>17–20, NE VI 9 1142<sup>b</sup>2, 15, VII 3 1147<sup>a</sup>25–31).

#### Note 10

**Many memories of the same thing finally bring about the capacity of one experience** (*empeiria*): A person A perceives that when  $X_1$  is sick with a fever giving him honey-water is followed by a reduction in fever (E 2 1027<sup>a</sup>23–24). He retains this connection in his memory. Then he perceives that giving honey-water to  $X_2$ ,  $X_3$ , . . .  $X_n$  is also followed by a reduction in their fever. A also retains these connections in his memory. When as a result of retaining them A associates drinking honey-water with fever reduction, he has “one experience,” since “from memory (when it occurs often in connection with the same thing) comes experience. For memories that are many in number form an experience that is one in number” (APo. II 19 100<sup>a</sup>4–6). The “same thing” mentioned in both texts is the connection between drinking honey-water and fever reduction. And the capacity of, or belonging to, that one experience is the capacity to treat a fever. This is what makes experience “pretty much similar” to scientific knowledge and craft knowledge (981<sup>a</sup>1–2). The difference between them is that A does not know *why* honey-water reduces fever only that it does.

#### Note 11

**Scientific knowledge** (*epistêmê*): (1) Aristotle usually divides sciences into three types: theoretical (contemplative), practical (action involving), and productive (crafts) (K 7 1064<sup>a</sup>16–19, Top. VI 6 145<sup>a</sup>15–16). But sometimes a more fine-grained classification is employed, in which sciences previously classified as theoretical (such as physics, biology, and others dealing with the sublunary world) are reclassified as “natural sciences” and distinguished from theoretical sciences in the strict sense (such as astronomy and theology), which deal with the superlunary sphere of eternal things (E 1 1025<sup>b</sup>18–1026<sup>a</sup>32, Ph. II 7 198<sup>a</sup>21–<sup>b</sup>4). In the *Metaphysics* the term *epistêmê* is typically reserved for the unconditional scientific knowledge that is provided exclusively by the strictly theoretical sciences (NE VI 3 1139<sup>b</sup>31–34). Here, however, it is used in the looser sense which encompasses the natural, practical, and productive sciences as well. To understand what a science of any of these sorts is, we must begin a few steps back.

(2) An *assertion* is the true (or false) predication of a single predicate term A of a single subject term B, either as an affirmation (*kataphasis*) (A belongs to B) or a denial (*apophasis*) (A does not belong to B) (Int. 8). What makes a

term a single subject term, however, is not that it is grammatically singular or serves as a grammatical subject but that it designates a substantial particular—a canonical example of which is a perceptible matter-form compound, such as Socrates. Similarly, what makes a term a predicate is that it designates a universal (man, pale)—something that can have many particular instances. When the role of predicate is restricted to universals, therefore, while that of subject is left open to both particulars and universals, it is more on ontological or metaphysical grounds than on what we would consider strictly logical ones. Subjects and predicates are thus ontological items, types of beings, rather than linguistic or conceptual ones, and logical principles, such as PNC, are very general ontological principles, truths about all beings as such, or qua beings. Particular assertions (Socrates is a man) and general assertions (Men are mortal) have the same subject-predicate form, but when the subject is a universal, the assertion may itself be either universal (All men are mortal) or particular (Some men are mortal)—that is to say, the predicate may be asserted (denied) of the subject either universally (*katholou*) or in part (*kata meros*) or, if the quantifier is omitted (Men are mortal), indefinitely (*adihoristos*). General assertions, as a result, which are the only ones of interest to science (Z 15 1039<sup>b</sup>27–31), are of four types: A belongs to all B (aAB), A belongs to no B (eAB), A belongs to some B (iAB), A does not belong to all B (oAB).

(3) A *science*, whether theoretical or one of the other sorts, is a state of the soul that enables its possessor to give demonstrative explanations—where a demonstration (*apodeixis*) is a special sort of deduction (*sullogismos*) from scientific starting-points and a deduction is “an argument in which, certain things having been supposed, something different from those supposed things necessarily results because of their being so” (A<sub>Pr.</sub> I 2 24<sup>b</sup>18–20). The things supposed are the argument’s premises; the necessitated result is its conclusion; all three are assertions of one of the four types we looked at. In Aristotle’s view, such deductions are *sylogisms* (*sullogismos*, again) consisting of a major premise, a minor premise, and a conclusion, where the premises have exactly one “middle” term in common, and the conclusion contains only the other two “extreme” terms. The conclusion’s predicate term is the *major term*, contributed by the major premise; its subject is the *minor term*, contributed by the minor premise. The middle term must be either subject of both premises, predicate of both, or subject of one and predicate of the other. The resulting possible combinations of terms yield the so-called figures of the syllogism:

	First figure		Second figure		Third figure	
	Predicate	Subject	Predicate	Subject	Predicate	Subject
Premise	A	B	A	B	A	C
Premise	B	C	A	C	B	C
Conclusion	A	C	B	C	A	B

Systematic investigation of the possible combinations of premises in each of these figures results in the identification of the *moods* or modes that constitute valid deductions. In the first figure, these are as follows:

Form	Mnemonic	Proof
aAB, aBC   aAC	Barbara	Perfect
eAB, aBC   eAC	Celarent	Perfect
aAB, iBC   iAC	Darii	Perfect (or from Camestres)
eAB, iBC   oAC	Ferio	Perfect (or from Cesare)

A mood is perfect when there is a proof of its validity that is *direct*, in that it does not rely on the validity of any other mood. Only first figure syllogisms have perfect moods.

(4) Besides their logical interest as admitting of direct proof, perfect syllogisms in Barbara are also of particular importance to science. First, because "syllogisms that give the why, which hold either universally or for the most part, in most cases are carried out through this figure. That is why it is the most scientific of all; for getting a theoretical grasp on the why is most important for [scientific] knowledge" (APo. I 14 79<sup>a</sup>20–24). Second, "only through this figure can you hunt for scientific knowledge of something's essence" (79<sup>a</sup>24–25): essences hold universally, only perfect syllogisms in Barbara have universal conclusions, and definitions of essences, which are scientific starting-points, must hold universally.

(5) Specifically scientific starting-points are of just three types (APo. I 10 76<sup>a</sup>37–<sup>b</sup>22). Those *special* to a science are definitions of the real (as opposed to nominal) essences of the beings with which the science deals (II 3 90<sup>b</sup>24, II 10 93<sup>b</sup>29–94<sup>a</sup>19). Because these are definitions by genus and differentia (II 13 96<sup>a</sup>20–97<sup>b</sup>39), a single science must deal with a single genus (Z 12, APo. I 7 75<sup>b</sup>10–11, I 23 84<sup>b</sup>17–18, 28 87<sup>a</sup>38–39). Other starting-points (so-called axioms) are common to all or many sciences (APo. I 2 72<sup>a</sup>14–24, I 32 88<sup>a</sup>36–<sup>b</sup>3). A third sort of starting-point posits the existence of the genus with which the science deals, but this may often be left implicit if the existence of the genus is clear (I 10 76<sup>b</sup>17–18). The source of these starting-points, in turn, is perception and experience, which lead by induction to a grasp by understanding of them: "From perception memory comes to be, and from many memories of the same thing, experience. For, then, memories that are many in number form one experience. And from experience, or from the whole universal that has come to rest in the soul (the one over and above the many, this being whatever is present as one and the same in all of them), comes a starting-point (*archê*) of craft knowledge and scientific knowledge—of craft knowledge if it concerns production (*genesis*), of scientific knowledge if it concerns being" (APo. II 19 110<sup>a</sup>3–9).

(6) To constitute a *demonstration* a deduction must be a valid syllogism in the mood Barbara, whose premises meet a number of conditions. First, they must be immediate or indemonstrable, and so must be reached through

induction. Second, our confidence in them must be unsurpassed (A 9 992<sup>b</sup>33n). Finally, they must be necessary (and so, of course, true) in a special sense: the predicates in them must belong to the subjects in every case, intrinsically, and universally (APo. I 4 73<sup>a</sup>24–27): (6a) *In every case*: A predicate A belongs to every subject B if and only if there is no B to which it fails to belong and no time at which it fails to belong to a B: “for example, if animal belongs to every man, then if it is true to say that this thing is a man, it is also true to say that it is an animal, and if the former is the case now, the latter is also the case now” (73<sup>a</sup>29–31). (6b) *Intrinsically*: A predicate A belongs intrinsically to a subject B just in case it is related to B in one of four ways: (i) A is in the account or definition of what B is, or of B’s substance, or essence (73<sup>a</sup>34–37); (ii) B is a complex subject  $\phi B_1$ , where  $\phi$  is an intrinsic coincident of  $B_1$ —for example, odd number or male or female animal (M 3 1078<sup>a</sup>5–11)—and A is in the definition of  $\phi B_1$ ’s essence; (iii) A just is B’s essence; (iv) A is not a part of B’s essence or identical to it but stems causally from it, so that being B is an intrinsic cause of being A (73<sup>a</sup>34–<sup>b</sup>24). (6c) *Universally*: A predicate A belongs to a subject B universally just in case “it belongs to it in every case and intrinsically, that is, insofar as it is itself” (73<sup>b</sup>26–27).

(7) Because intrinsic predicates stem in various ways from essences, the subjects to which they belong must have essences. In other words, they must be *intrinsic beings*, since—stemming as they do from essences—intrinsic predicates identify them or make them clear: “The things said to be intrinsically are the very ones signified by the figures of predication” (A 7 1017<sup>a</sup>22–23). These figures of predication are the so-called *categories*: “Anything that is predicated (*katêgoroumenon*) of something must either be . . . a definition . . . if it signifies the essence . . . or, if it does not, a special property (*idion*) [see M 3 1078<sup>a</sup>8n] . . . or one of the things in the definition, or not; and if it is one of the things in the definition, it must signify the genus or the differentiae, since the definition is composed of genus and differentia. If, however, it is not one of the things in the definition, it is clear that it must be a coincident; for a coincident was said to be that which belongs to a thing but that is neither a definition nor a genus nor a special property. Next we must distinguish the kinds (*genos*) of predication in which one will find the four mentioned above. These are ten in number: what it is, quantity, quality, relation, when, where, position, having, doing, and being affected. For the coincidents, the genus, the special properties, and the definition will always be in one of these kinds of predication [or *categories*]” (Top. I 8–9 103<sup>b</sup>7–25). For each of the intrinsic beings in these ten *categories* we can state what it is (Z 4 1030<sup>a</sup>17–24), even if strictly speaking only substances have definitions and essences (5 1031<sup>a</sup>7–24). Specifying these beings is one of the tasks of *Categories*, where Aristotle explains how beings in categories other than that of substance are ontologically dependent on those in the category of substance. The list of categories itself, however, has a somewhat provisional status, as Aristotle’s remark about the category of *having* indicates: “Some further ways of having might perhaps come to light, but we have made a pretty complete enumeration of those commonly spoken of” (Cat. 15 15<sup>b</sup>30–32).

(8) What all four types of intrinsic beings have in common, what makes them worth the attention of someone inquiring into ultimate starting-points and causes, is that they are the ontological correlates or truth-makers for scientific theorems—the beings responsible for the necessary truth of those theorems. Moreover, they would seem to be the only sorts of being that can play this role, since they constitute an exhaustive catalogue of the necessary relations that can hold between a subject (A) and something (B) predicated of it: B is part of the essence of A; A is part of the essence of B; B is the essence of A; the essence of A (being A) is an intrinsic cause of (being) B.

#### Note 12

##### **Scientific knowledge and craft knowledge come to humans through experience:**

It is from experience that all scientific knowledge—theoretical or otherwise—comes to human beings. But the scientific knowledge soon to be attributed, for example, to the (primary) god is not based in experience (A 2 983<sup>a</sup>4–7), since he does not have the perceptual capacities and memory required for experience, and has, in any case, not acquired his scientific knowledge from any source, since he has always had it in its active form (A 7 1072<sup>b</sup>14–30).

#### Note 13

**Polus of Acragas:** Mid 5th cent BC. A student of the sophist Gorgias of Leontini. Plato gives Polus' adage in a slightly different form: "experience makes our age proceed in accord with craft, inexperience in accord with luck" (Grg. 448b5–7).

**Luck** (*tuchê*): See K 8 1065<sup>a</sup>30–32.

#### Note 14

**Intelligible objects belonging to experience** (*tês empeirias ennoêmata*): The word *ennoêmata* (singular: *ennoëma*) does not occur elsewhere in Aristotle, but an *ennoëma*, since it is grasped by experience rather than craft or science, must be found at a stage in the inductive route from particulars to intelligible universals or forms (A 9 992<sup>b</sup>33n). For an intelligible object or content (*noëma*) is a form (*eidos*) (as at 981<sup>a</sup>10), which is usually encoded in an appearance, and can be grasped by the understanding (*nous*) when it contemplates (*theôrein*) that appearance: "To the understanding (*dianoêtikê*) soul appearances (*phantasmata*) are like perceptual contents (*aisthêmata*). . . . The part that understands, then, understands the forms in the appearances (*eidê . . . en tois phantasmasi*)" (DA III 7 431<sup>a</sup>14–<sup>b</sup>10). It differs from an appearance in being an affirmation, evaluable as true or false: "when someone contemplates (*theôrê[i]*), he must at the same time contemplate an appearance (*phantasma*). . . . However, imagination (*phantasia*) is distinct from affirmation and denial, since truth and falsity involve a combination of intelligible objects (*noëmatôn*)" (8 432<sup>a</sup>8–12).

**Supposition** (*hupolêpsis*): *Hupolêpsis* is like belief (*doxa*), but unlike scientific knowledge, in that it can be false as well as true (NE VI 3 1139<sup>b</sup>15–18). But whereas belief must be based on rational calculation (Γ 4 1008<sup>b</sup>30–31), supposition need not be.

# Note 15

**Callias:** Almost certainly Callias of Alopecce, son of Hipponicus, a wealthy patron of Protagoras and other sophists (Plato, *Ap.* 20a, *Prt.* 314d, 315d, *Crat.* 391b).

**Socrates:** Socrates of Alopecce, son of Sophroniscus, historical prototype for the protagonist of most of Plato's dialogues.

# Note 16

**Form (*eidōs*):** The “shape (*morphē*) or form” is what is “in accord with the account” (*Ph.* II 1 193<sup>a</sup>30–31); “By form I mean the essence of each thing” (*Z* 7 1032<sup>b</sup>1–2).

**For example, phlegm-filled or bilious people:** Retaining οἷον τοῖς φλεγματώδεσιν ἢ χολώδεσιν ἢ πυρρέρτουσι καύσω, which OCT brackets for deletion, but omitting ἢ before πυρρέρτουσι with Primavesi.

**Is a matter of craft:** See A 1 981<sup>a</sup>2n(5).

# Note 17

**Account (*logos*):** A *logos* in Greek is a word or organized string of words constituting an account, argument, explanation, definition, principle, argument, reason, or piece of reasoning, discussion, conversation, or speech; what such words or their utterances mean, express, or refer to, such as, the ratio between quantities (*NE* V 3 1131<sup>a</sup>31–32); the capacity that enables someone to argue, give reasons, and so on (*Pol.* VII 13 1332<sup>b</sup>5). Aristotle also uses the word in a more technical sense: “A *logos* is a significant voiced sound some part of which is significant when separated—as an annunciation (*phasis*), not as an affirmation (*kataphasis*). I mean, for example, that human signifies something, but not that the thing is or is not (though it will be an affirmation or denial if something is added); the single syllables of human, by contrast, signify nothing” (*Int.* 4 16<sup>b</sup>26–31).

# Note 18

**Experience is knowledge of particulars (*kath' hekasta*), whereas craft knowledge is of universals (*katholou*):** The usual contrast is between particulars, as things that are severally one in number and jointly many (B 4 999<sup>b</sup>34–1000<sup>a</sup>1), with universals, which belong to many numerically distinct particulars (*Z* 13 1038<sup>b</sup>11–12). But sometimes what is *kath' hekaston* is what is less universal than something else. Thus while true particulars are indefinable (15 1039<sup>b</sup>27–29, 1040<sup>a</sup>27–<sup>b</sup>4), it is “easier to define *kath' hekaston* than the universal” (*APo.* II 13 97<sup>b</sup>28), and a definition of a universal “divides it into *kath' hekasta*” (*Ph.* I 1 184<sup>b</sup>2–3), where these are things that are particular in the sense of being “indivisible in species” (*PA* I 4 644<sup>a</sup>30–31).

**Actions and productions are all concerned with particulars:** “Nor is practical wisdom [knowledge] of universals only, on the contrary, it must also know particulars; for it is practical [action involving], and action has to do with particulars” (*NE* VI 7 1141<sup>b</sup>14–16). Parallel considerations apply in the case of craft knowledge, which is concerned with production rather than action. The usual terms of contrast are *praxis* (action) and *poiēsis* (production). Here, however, Aristotle substitutes *genesis* for *poiēsis*.



## Note 19

**Spoken of in that way:** That is, as a particular human with a proper name.

**Who happens coincidentally to be a human:** A standard Aristotelian contrast is between what has an attribute B coincidentally or contingently (*kata sumbebêkos* or *per accidens* in Latin) and what has B intrinsically or non-contingently (*kath' hauto* or *per se*) (Δ 18 1022<sup>a</sup>24–36). Relative to textbook cases of humans and dogs, Socrates or (as in veterinary medicine) Fido may be quite non-standard, and so may require treatment that is itself very different from what the textbook prescribes. For though health has a definition, the same “balance does not exist in every healthy person, nor does the same one always exist in the same person, but it may be loosened to a certain point and still remain present, so differing in terms of more and less” (NE X 3 1173<sup>a</sup>23–28). That Socrates and Fido belong intrinsically and essentially to their species does not change this fact, which is why they, or their sickly condition (M 3 1077<sup>b</sup>34–1078<sup>a</sup>2), and not their species—or their species textbook examples—are the intrinsic or “proper” objects of treatment. For a parallel, see Z 8 1033<sup>a</sup>29–30, and on “more and less,” H 3 1044<sup>a</sup>10n.

## Note 20

**If, then, someone without experience has the account and knows the universal, but does not know the particular included under it, he will often make an error in treatment, since it is the particular that admits of treatment:** “Some people who lack knowledge (*ouk eidotes*)—especially those with experience—are more practical than others who have knowledge. For if someone knows that light meats are digestible and healthy, but does not know which sorts of meat are light, he will not produce health, but the one who knows that bird meats are healthy will produce health more” (NE VI 7 1141<sup>b</sup>16–21).

## Note 21

**The cause** (*hê aitia*): See 980<sup>a</sup>26n.

## Note 22

**The that** (*to hoti*): The fact that something is the case.

**The why** (*to dioti*), **that is** (*kai*), **the cause:** “We do not think we know each thing until we have grasped the why of each (which is to grasp its primary cause)” (Ph. II 3 194<sup>b</sup>18–20).

## Note 23

**Architectonic practitioners** (*architektôn*): Aristotle distinguishes between craftsmen of different degrees of excellence: (1) The lyre player and the good lyre player have the same function, but the latter has “the superior achievement that is in accord with the virtue (for it is characteristic of a lyre player to play the lyre and of a good one to do so well)” (NE I 7 1098<sup>a</sup>8–12). (2) Some craftsmen know all that is in the craft handbook, so to speak, but when it comes to problems that lie outside it, and so require deliberation, they sometimes arrive at reasons that are false (VI 5 1140<sup>a</sup>28–30). These people know all the true handbook reasons but not the true deliberative ones. They may be good craftsmen for routine jobs, but,

lacking the relevant sort of practical wisdom, they are not good for hard cases. (3) Some craftsmen are wise (*sophos*) in that they are the most exact practitioners of their craft (7 1140<sup>b</sup>9–10). They know not just the true handbook and deliberative reasons but the ultimate explanatory ones—those that might be found in the most rigorous treatises on the craft's starting-points. Thus what distinguishes “those doctors who pursue their craft in a more philosophical or wisdom-loving way” is that their search for the “primary starting-points of health and disease” leads them to begin by considering nature in general (*Sens.* 1 436<sup>a</sup>17–<sup>b</sup>1; also *Juv.* 21 480<sup>b</sup>22–30). This third class is that of the architectonic craftsmen, who, because they know the ultimate explanatory starting-points, have the most control, the most authority: “Politics seems to be the most architectonic science, since it is the one that prescribes which of the sciences need to exist in cities and which ones each class in cities should learn and up to what point. Indeed, we see that even the capacities that are generally most honored are under it—for example, generalship, household management, and rhetoric. And . . . it uses the other practical sciences and, furthermore, legislates about what must be done and what avoided” (*NE* I 2 1094<sup>a</sup>26–<sup>b</sup>6). Hence, “the ones who above all do actions, even external actions, in a controlling way are their architectonic craftsmen who do them by means of their thoughts” (*Pol.* VII 3 1325<sup>b</sup>22–23).

**More estimable:** See A 2 983<sup>a</sup>5n.

#### Note 24

**Having the account themselves:** “Someone will be a grammarian, then, if he both produced something grammatical and in the way a grammarian would produce it. And this is to do it in accord with the craft knowledge of grammar that is internal to himself” (*NE* II 4 1105<sup>a</sup>23–26).

#### Note 25

**An indication of the person who knows, as opposed to the person who does not know, is his capacity to teach (*didaskein*):** “Certain animals share naturally in some learning and teaching, some from each other, some from humans, these are the ones that have hearing—not just those that hear sounds but those that further perceive the differences between signs” (*HA* IX 1 608<sup>a</sup>17–21; also *Pol.* I 2 1253<sup>a</sup>1–18, *Po.* 19 1456<sup>b</sup>5–7). In the full sense, then, teaching is a linguistic activity that involves giving formal instruction in a craft or science: “Teaching is argument (*logos*) based on scientific knowledge” (*Rh.* I 1 1355<sup>a</sup>26); “It is from things already known, however, that all teaching proceeds, . . . since some is through induction and some by deduction” (*NE* VI 3 1139<sup>b</sup>26–28).

#### Note 26

**Perceptual capacities are most in control (*kuriōtatai*) . . . of the knowledge of particulars:** Because they alone give us cognitive access to particulars and their attributes (*APo.* I 18 81<sup>a</sup>38–<sup>b</sup>6, *NE* VII 3 1147<sup>a</sup>25–26).

**Control:** Control is fundamentally executive power or authority or the power to compel, so that a general is *kurios* over his army (*NE* III 8 1116<sup>a</sup>29–<sup>b</sup>2) and a political ruler is *kurios* over a city and its inhabitants. Since what is *kurios* in a sphere deter-

mines or partly determines what happens within it, it is one of the most estimable or important elements in the sphere, so that what is inferior or less important than something cannot control it (VI 12 1143<sup>b</sup>33–35, 13 1145<sup>a</sup>6–7). Hence *kuria aretê* is “full virtue” or virtue in the full or strict sense of the term (13 1144<sup>b</sup>1–14). It is in this sense that the life of those who are active and awake is a more *kurios* life—life in a fuller sense—than that of the inactive or asleep (I 7 1098<sup>a</sup>5–8), and that form is a more *kurios* starting-point than matter (K 2 1060<sup>a</sup>21–22).

#### Note 27

**Other crafts are related to passing the time** (*diagôgê*): Aristotle has in mind such crafts (arts, skills) as music and dancing, at least as these are popularly conceived, since most people think that they are “for the sake of amusement and relaxation” (*Pol.* VIII 5 1339<sup>a</sup>14–26). He agrees that music is useful for these purposes, but he also assigns it a role in education and, what is much more important and estimable, in truly leisured pastimes: “Music is for passing the time in leisure—which is manifestly just why people introduce it. For they assign it a place in what they think to be a pastime characteristic of free people” (VIII 3 1338<sup>a</sup>21–24; also 5 1339<sup>b</sup>10–7 1342<sup>b</sup>34).

#### Note 28

**The mathematical crafts first arose in Egypt:** Compare Plato, *Phaedrus* 274c.

**There the priestly class were allowed to be at leisure** (*scholê*): Aristotle’s way of thinking about leisure overlaps with ours, but differs from it in important ways. We think of leisure time as time off from work in which we can do as we choose. Aristotle agrees that leisure time and work time (unleisure) are distinct, but thinks that activities that are entirely leisurely must be choiceworthy solely because of themselves. Among these, he includes such scientific activities as the exercise of theoretical wisdom or mathematical knowledge, which we might think of as work. In these, he thinks, complete happiness consists (*NE* X 7 1177<sup>b</sup>19–26). Entirely unleisurely activities, he thinks, are choiceworthy solely because of some additional end, such as producing or providing the necessities of life (X 6 1176<sup>b</sup>2–3)—included among these are the canonical productive crafts (Θ 6 1048<sup>b</sup>18–35). Activities which are choiceworthy in part because of themselves, and in part because of an additional end, include activities in accord with practical wisdom and the virtues of character. These too constitute happiness, but of a less than complete or secondary sort (*NE* X 7 1177<sup>b</sup>4–18, 8 1178<sup>a</sup>9–22). Most people would include amusing pastimes as leisurely activities par excellence (X 6 1176<sup>b</sup>6–17), but Aristotle does not agree: “Happiness is not found in amusement, since it would be absurd indeed for the end to be amusement, and our life’s labors and sufferings to be for the sake of amusement. For we choose almost everything, except happiness, for the sake of something else, since it is the [unconditional] end. To work hard and toil [just] for the sake of amusement, however, appears a silly and entirely childish thing to do. Rather ‘play to be serious,’ as Anacharsis puts it, seems to have it right. For amusement is a form of relaxation, and it is because we cannot toil continuously that we need relaxation. Relaxation, then, is not an end, since it occurs for the sake of activity [in accord with virtue]” (X 6 1176<sup>b</sup>27–1177<sup>a</sup>1). Nonetheless,

because humans do have to engage in un leisured practical and productive activities, a good political constitution should “introduce amusement, but watch for the appropriate time to use it, as if dispensing it as a medicine [for the ills of un leisured]” (*Pol.* VIII 3 1337<sup>a</sup>35–42; also VIII 5 1339<sup>b</sup>31–42).

#### Note 29

**Other things of the same kind:** These are “states in which the soul grasps the truth by way of affirmation and denial” (*NE* VI 3 1139<sup>b</sup>15–17). Besides craft knowledge and scientific knowledge, they include practical wisdom, theoretical wisdom, and understanding, all of which are discussed in *NE* VI 3–11.

#### Note 30

**Everyone takes what is called “wisdom” (*sophia*) to be concerned with the primary causes and the starting-points (*ta prôta aitia kai tas archas*):** An *archê* (“starting-point,” “first principle”) is a primary cause: “This is what it is for something to be a starting-point, that it is itself the cause of many things, with nothing above it being a cause of it” (*GA* V 7 788<sup>a</sup>14–16; compare *N* 1 1087<sup>a</sup>31–36). But while a special science deals with a single genus of beings, and so has starting-points special to it (*A* 1 981<sup>a</sup>3n(5)), *sophia*—translated as “wisdom” here, but as “theoretical wisdom” when Aristotle’s own conception of wisdom is involved—does not deal with a single genus but with being as such, or qua being, and its “primary causes” (*Γ* 1). Thus wisdom is “scientific knowledge of certain sorts of starting-points and causes” (982<sup>a</sup>2–3), namely, “the primary starting-points and causes (*tôn prôtôn archôn kai aitiôn*)” (*A* 2 982<sup>b</sup>9–10), or “the starting-points and the highest causes (*tas archas kai tas akrotatas aitias*)” (*Γ* 1 1003<sup>a</sup>26–27).

#### Note 31

**Theoretical wisdom (*sophia*) is scientific knowledge of certain sorts of starting-points and causes:** Craft-specific wisdom (also, *sophia*) is attributed to those who practice that craft in its most exact (*akribês*) form. Theoretical wisdom about things as a whole is the most exact form of scientific knowledge, which deals with the ultimate explanatory starting-points and causes of beings as such (*NE* VI 7 1141<sup>a</sup>9–20). As such, it is one of the virtues of thought, the other being practical wisdom.

#### Note 32

**If we were to get hold of the suppositions we have about the theoretically-wise person, perhaps the answer will thereby become more evident:** Compare: “Where practical wisdom is concerned, we may get hold of it once we get a theoretical grasp on what sort of person we say (*legomen*) is practically-wise” (*NE* VI 5 1140<sup>a</sup>24–25). The things we say or the suppositions we have about something are guides to its nominal essence, and so are starting-points for an inquiry into what that thing really is, or what its real essence is. See Introduction, pp. xlii–xliv.

#### Note 33

**We take it that what a wise person has scientific knowledge about is all things, insofar as they admit of it, without his having particular scientific knowledge of them:** Particular (or special) sciences (such as physics or biology) deal with a

part or area and look for causes and starting-points applicable to things within it. Theoretical wisdom looks for universal causes and starting-points (982<sup>a</sup>22), which are applicable to all things or things as a whole, and so are not the same as those that apply only to a restricted area: “Some people, we think, are wise about things as a whole (*holôs*), not wise in some area (*kata meros*)” (NE VI 7 1141<sup>a</sup>12–13). See E 1 1026<sup>a</sup>23–<sup>b</sup>32.

#### Note 34

**The person who has the capacity to know difficult things . . . is wise:** “Anaxagoras and Thales and people of that sort are said to be wise but not practically-wise when we see them to be ignorant of what is advantageous to themselves and why what they know is said to be extraordinary, wondrous, difficult, and worthy of worship but useless, because it is not human goods they seek” (NE V 7 1141<sup>b</sup>3–8).

#### Note 35

**Someone is wiser in any science if he is a more exact knower of it and a better teacher of the causes:** See M 3 1078<sup>a</sup>10n.

#### Note 36

**He in a way (*pôs*) knows all the things that fall under (*ta hupokeitmena*) it:** “If someone knows that every triangle has interior angles equal to two right angles, he in a way (*pôs*) also knows of the isosceles that it has interior angles equal to two right angles—that is, he knows it potentially (*dunamei*)—even if he does not know of the isosceles that it is a triangle. But someone who grasps the latter proposition does not in any way know the universal [one, namely, that every triangle has interior angles equal to two right angles], whether potentially or actually” (APo. I 24 86<sup>a</sup>25–29).

#### Note 37

**Furthest from perception:** “I call prior and more knowable to us what is closer to perception, unconditionally prior and more knowable what is further away. What is most universal is furthest away, and particulars are closest” (APo. I 2 72<sup>a</sup>1–5).

#### Note 38

**The most exact (*akribês*) of the sciences:** “Wisdom in crafts we ascribe to the most exact practitioners of the relevant craft (for example, calling Phidias a wise sculptor in stone and Polyclitus a wise sculptor in bronze), here signifying nothing else by wisdom, indeed, than that it is the virtue of a craft. There are, however, some people we think are wise about things as a whole, not wise in some area or wise in some other particular way, as Homer says in the *Margites*: ‘him the gods made neither a digger nor a ploughman nor wise in any other particular way.’ So, it is clear that theoretical wisdom must be the most exact of the sciences. Hence a theoretically-wise person not only must know what follows from the starting-points but also must grasp the truth where the starting-points are concerned. So theoretical wisdom must be understanding plus scientific knowledge—scientific knowledge, having a head as it were, of the most estimable things” (NE VI 7 1141<sup>a</sup>9–20).

**Primary things:** See Z 4 1030<sup>a</sup>10–11n.

**The most exact (*akribês*) . . . from an addition:** See M 3 1078<sup>a</sup>11n.

Note 39

**The ones that fall under them (*ta hupokeimena*):** As at 982<sup>a</sup>23.

Note 40

**The most ruling (*archikôtatê*) of the sciences:** Compare α 2 996<sup>b</sup>10–13. “Issuing prescriptions is particularly characteristic of office (*archikôteron*)” (Pol. IV 15 1299<sup>a</sup>27–28). So politics is the most architectonic (= most ruling) of the practical or productive sciences and the one with the most control (A 1 981<sup>a</sup>30n), whose end is “the human good” (NE I 2 1094<sup>b</sup>6–7). The human good, however, is the contemplative activity of the understanding in accord with theoretical wisdom, since this is what a human’s complete happiness consists in (X 6–8). That is why practical wisdom, of which politics is a part (VI 8 1141<sup>b</sup>29–33), “does not control either theoretical wisdom or the better part of the soul, any more than the craft of medicine does health; for it does not use it, but sees to its coming into being: it prescribes (*epitattei*) for its sake, therefore, but not to it” (VI 13 1145<sup>a</sup>7–9). But because the contemplative activity of the understanding is the end pursued by practical wisdom and politics, it exerts a control over them, although one that is telic rather than prescriptive: “For god is a ruler not by prescribing (*epitaktikôs*), but rather by being that for the sake of which practical wisdom prescribes (*epitattei*). . . . So whatever choice and possession of natural goods (whether goods of the body, or wealth, or friends, or any other goods) will most produce contemplation of the god, that is the best, and this is the noblest defining mark” (EE VIII 3 1249<sup>b</sup>13–19). Hence, by extension, its control is often characterized in prescriptive terms, as it is at 982<sup>a</sup>16–19: the understanding, as the highest element in us (DA III 11 434<sup>a</sup>14–15, PA II 10 655<sup>b</sup>3–13, NE X 7 1177<sup>b</sup>26–29), is the element in the soul that has “most control (*to kuriôtaton*),” and as the one a virtuous person always “obeys (*peithetai*)” or “obeys as his ruler (*peitharchei*)” (IX 8 1168<sup>b</sup>28–1169<sup>a</sup>18). Similarly, the [primary] god whose activity is entirely contemplative and who issues no prescriptions is analogized to such prescriptive rulers as the general of an army and the ruler of a city (A 10 1075<sup>a</sup>11–25, 1075<sup>b</sup>37–1076<sup>a</sup>4), because he is the ultimate teleological cause of everything.

**That for the sake of which each thing is to be done (*prakteon*):** Usually what is *prakteon* is what is to be done by an agent as a deliberately chosen action (NE II 2 1103<sup>b</sup>30, IV 9 1128<sup>b</sup>23). Here, however, the term clearly cannot literally mean this, since theoretical wisdom is not restricted in scope to humans or their actions, but deals rather with the starting-points and causes common to all things. Instead, *prakteon* is better understood as part of the somewhat metaphorical characterization of theoretical wisdom as architectonic and prescriptive. So as theoretical wisdom (non-literally) prescribes what humans are to do in deliberate action by (literally) being the end at which their actions aim, so it (non-literally) prescribes what other beings are to do by (literally) being the end at which they aim.

**The best good in all of nature (*to ariston en tê[i] phusei pasê[i]*):** The argument apparently parallels that in NE I 1–2. Because politics is the most architectonic

of the practical and productive sciences, its end encompasses (*periechein*) their particular ends and is the best human good and the ultimate end at which each of the others aims. Here the science of the primary causes of all things is the most architectonic of the sciences generally and so its end encompasses theirs and is the good of all of nature (A 8 1074<sup>b</sup>3). Somewhat less plausibly, the phrase means “the best good in every nature,” so that no unique best good, shared in common by all things, is involved. See also A 10 1075<sup>a</sup>11–12n.

#### Note 41

**This must be the one that gets a theoretical grasp on (*theôrêtikên*) the primary starting-points and causes:** The verb *theasthai*, with which *theôria* is cognate, means to look at or gaze at. Thus *theôria* itself is sometimes what someone is doing in looking closely at something, or actively observing, studying, or contemplating it, and sometimes the capacity someone has to do these things (Θ 6 1048<sup>a</sup>34–35, 8 1045<sup>a</sup>36). When *theôria* is an exercise of understanding (*nous*), which is the element responsible for grasping scientific starting-points (NE VI 6 1141<sup>a</sup>7–8), such as (the definition of) right angle in the case of geometry, or (the definition of) happiness in the case of politics, it is translated as “contemplation,” and the cognate verb *theôrein* as “contemplate.” The corresponding capacity is translated as “theoretical knowledge,” and what gives rise to it as “getting a theoretical grasp on.” So when we get a theoretical grasp on A, we acquire theoretical knowledge of A, which we actualize in contemplating A.

#### Note 42

**It is because of wondering at things:** “Both learning things and wondering at things are for the most part pleasant, since in wondering lies the appetite for learning, so that an object of wonder is an object of appetite, while in learning we are brought into our natural condition” (Rh. I 11 1371<sup>a</sup>31–34).

**That humans, both now and at first, began to do philosophy:** Aristotle sometimes applies the term *philosophia* (or sometimes just *sophia*) to any science aiming at truth rather than action (α 1 993<sup>b</sup>19–21). In this sense of the term, all the broadly theoretical sciences count as branches of philosophy, and *philosophia* is more-or-less equivalent in meaning to *epistêmê* in its most exact sense. *Philosophia* also has a narrower sense, however, in which it applies exclusively to sciences providing knowledge of starting-points (K 1 1059<sup>a</sup>18, NE VI 7 1141<sup>a</sup>16–18). It is in this sense that there are just “three theoretical philosophies—mathematical, natural, and theological” (E 1 1026<sup>a</sup>18–19). In addition to these, Aristotle occasionally mentions practical philosophies, such as “the philosophy of human affairs” (NE X 9 1181<sup>b</sup>15). It is among these that his own ethical writings belong (Pol. III 12 1282<sup>b</sup>18–23).

#### Note 43

**At the start, they wondered at those of the puzzles that were close to hand:** Reading τὰ πρόχειρα τῶν ἀνθρώπων with Primavesi for OCT τὰ πρόχειρα τῶν ἀτόπων (“the strange things that were close at hand”).

**Puzzles (*aporôn*):** See A 7 988<sup>b</sup>21n.

**The attributes (*pathê*) of the moon:** What X *paschei* (“suffers” or “undergoes”) is what happens to him, so that he is passive with respect to it, as opposed to what he *poiei* (“does as an agent” or “produces”). When Y does something to X, X is affected by it, so his *pathê* as a result are, in one sense, his affections or attributes and, in another, his passions or feelings.

**The universe (*tou pantos*):** See A 1 1069<sup>19</sup>n.

#### Note 44

**The philosopher is in a way a mythlover:** Reading φιλόμυθος ὁ φιλόσοφος πῶς with Primavesi for OCT ὁ φιλόμυθος φιλόσοφος πῶς (“the mythlover is in a way a philosopher”). In a fragment of one of his letters to the Macedonian general Antipater, Aristotle writes, “the more I am a ‘selfer’ (*autitês*) and a loner, the more of a mythlover I become” (F668 R<sup>3</sup> = Barnes pp. 2461–2462). Notice the common root of *philo-muthos* and *philo-sophos*.

#### Note 45

**Wisdom (*phronêsis*):** *Phronêsis*, which is often specifically *practical* wisdom, is here, as frequently elsewhere, a synonym for wisdom of any sort, including the theoretical wisdom (*sophia*) sought by the early philosophers.

#### Note 46

**The only free science:** “Fine and free arguments that vigorously seek the truth in every way, so as to acquire knowledge” (Plato, *Rep.* VI 499a); “the science that free people have” (Plato, *Sph.* 253c–d).

**Free (*eleutheros*):** See A 10 1075<sup>19</sup>n.

**It alone is for its own sake (*monê gar hautê hautês heneken*):** Since the mathematical crafts have already been characterized as aiming “neither at pleasure nor at necessities” (A 1 981<sup>21–22</sup>) implying that they also exist for their own sake, we should presumably understand the present claim about theoretical wisdom as meaning that it alone is *solely* for its own sake. Compare the characterization of contemplation in accord with theoretical wisdom as “this activity would seem to be liked because of itself alone (*autê monê di’ hautên agapan*)” (NE X 7 1177<sup>b1</sup>) and notice *monê* (“alone”) at 983<sup>6</sup> below.

#### Note 47

**Simonides:** A poet from Iulis on Ceos (c. 556/532–466/442 BC). None of his surviving poems explain the allusion to him. He did, however, have a reputation for acquisitiveness, and this may be what Aristotle has in mind.

**The science that is in accord with himself:** That is, politics (*politikê*), which is the practical science “concerned with human things” (NE VI 7 1141<sup>b8–9</sup>). Aristotle’s own advice is the opposite of Simonides’: “We should not, however, in accord with the makers of proverbs, ‘think human things (*anthrôpina*), since you are human,’ or ‘think mortal things, since you are mortal,’ but rather we should as far as possible immortalize (*athanatizein*), and do everything to live in accord with the thing in us that is most excellent (*kratiston*)” (X 7 1177<sup>b31–34</sup>). The divine thing = understanding (X 8 1178<sup>b24–25</sup>).



## Note 48

**The divine cannot be jealous:** “Jealousy is excluded from the divine chorus” (Plato, *Phdr.* 247a); “Being free of jealousy, he [the Demiurge] wished everything to become as much like himself as possible” (Plato, *Ti.* 29e); “Let none of the Greeks fear that it is not just for them to busy themselves about divine issues, since they are mortals. They must think entirely the opposite, that what is divine is never foolish or in any way ignorant of human nature, but knows that if it teaches us, we will follow its guidance and learn what is taught to us. It surely knows that it is teaching us and that we are learning about just this—number and to do arithmetic. For it would be the most foolish of all, if it were ignorant of this, since it would, as we say, really lack knowledge of itself, if it were displeased by, rather than enjoying without jealousy, our capacity to learn” (Plato, *Epin.* 988a–b).

## Note 49

**No science should be regarded as more estimable (*timioteros*) than this:** The core sense of *timios* (“estimable”) is captured in the remark that ordinary people “commonly say of those they find especially estimable and especially love that they ‘come first’” (*Cat.* 12 14<sup>b5</sup>–7). Something is thus objectively *timios* when—like starting-points and causes—it “comes first by nature” (14<sup>b3</sup>–5). To say that something is estimable is thus to ascribe a distinct sort of goodness or value to it: “By what is estimable I mean such things as what is divine, what is superior (*bel-tion*) (for example, soul, understanding), what is more time-honored (*archaioteron*), what is a starting-point, and so on” (*MM* I 2 1183<sup>b21</sup>–23). Thus happiness is “something estimable and complete . . . since it is a starting-point . . . and the starting-point and the cause of goods is something we suppose to be estimable and divine” (*NE* I 12 1102<sup>a1</sup>–4).

## Note 50

**The [primary] god:** Aristotle recognizes the existence of a number of different divine beings or gods, among whom he distinguishes a primary god, referred to as *ho theos* (“the god”), which is the one under discussion here. See A 8–10.

## Note 51

**This is the sort of science that the [primary] god alone, or that he most of all, would have:** See A 9 1074<sup>b15</sup>–1075<sup>a5</sup>.

## Note 52

**All the sciences are more necessary than this one, then, but none is better:** Sciences are necessary in the relevant sense when they are concerned with providing the necessities of life, as, for example, the mathematical sciences are not (A 1 981<sup>b21</sup>–22). Nonetheless, nothing prevents such sciences from being “coincidentally useful to us where many of the necessities of life are concerned” (*EE* I 6 1216<sup>b15</sup>–16). Theoretical wisdom, by contrast, does not even coincidentally “have a theoretical grasp on any of the things from which a human will come to be happy” (*NE* VI 12 1143<sup>b19</sup>–20).

Note 53

**Automata:** Puppets operated by a concealed inner mechanism (*Mech.* 848<sup>a</sup>3–37). Also referred to at *MA* 7 701<sup>b</sup>2, *GA* II 1 734<sup>b</sup>10, 13, 5 741<sup>b</sup>9, and at Plato, *Rep.* VII 514b.

**The cause** (*hê aitia*): See A 1 980<sup>a</sup>26n. Reading τοῖς μήπω θεωρηκόσι τὴν αἰτίαν (“when they do not have a theoretical grasp on their cause”) with the mss. OCT brackets it for deletion here and reads it following πᾶσι (“everyone”) at 983<sup>a</sup>16.

**The incommensurability of the diagonal:** That is, of the diagonal of a rectangle with its sides (*Iota* 1 1052<sup>a</sup>17).

**For it seems a wonder to everyone that a more-than-minimal magnitude is not measurable:** Reading εἴ τι τῶν οὐκ ἐλαχίστων μὴ μετρεῖται with Primavesi for OCT εἴ τι τῷ ἐλαχίστῳ μὴ μετρεῖται (“that there is a thing that cannot be measured even by the smallest magnitude”).

Note 54

**A man** (*anêr*) **who knows geometry:** *Anêr* is sex specific—it means “male human.” *Anthrôpos* is sex neutral—it means “human” or “man” in the sex neutral sense. I have usually respected this difference, except when doing so would itself cause confusion—*ho tritos anthrôpos* (for example, A 9 990<sup>b</sup>17) is conventionally translated as “the Third Man,” not as “the Third Human.”

Note 55

**Target** (*skopos*): The notion of a *skopos*, which belongs primarily to archery, is used metaphorically to refer to any end or goal (*EE* I 2 1214<sup>b</sup>6–9, II 10 1227<sup>a</sup>5–7, *Pol.* VII 13 1331<sup>b</sup>6–8, *Rh.* I 6 1362<sup>a</sup>15–20).

**Methodical inquiry** (*methodos*): A *methodos* is a *tropos tês zêtêseôs* (*APo.* I 31 46<sup>a</sup>32<sup>b</sup>36). *Hodos* means “route” or “road,” as at *NE* I 4 1095<sup>a</sup>33.

Note 56

**Cause** (*aitia*): See A 1 980<sup>a</sup>26n.

Note 57

**Things are said to be causes in four ways:** These are usually referred to as formal, material, efficient, and final causes.

Note 58

**The substance** (*tên ousian*) **or the essence** (*to ti ên einai*): *Ousia* is a noun formed from the present participle *ousa* of the verb *einai* (“to be”). “Substance” is the traditional translation. (1) The *substance* of something (the sense relevant here) is its what-it-was-to-be (*Δ* 8 1017<sup>b</sup>21–23), a phrase of Aristotle’s coinage, of which “essence,” from the Latin verb *esse* (“to be”) is the standard translation. The imperfect tense *ên* (“was”) may—as in the Latin phrase *quod erat demonstrandum* (“which was to be proved”)—stem from an original context (such as a Socratic conversation) in which someone is asked to say or define what X is, and concludes by giving his answer in the imperfect tense to signal that he is giving the answer that *was* asked for (*ên* at Z 4 1030<sup>a</sup>1 may be a case in point). Apart from that the tense seems to have no special significance, so we could

equally well translate *to ti ên einai* as “the what-it-is-to-be.” (2) *A substance*, on the other hand, is something that has the fundamental sort of being possessed by an ultimate subject of predication, which is not itself ever predicated of anything else ( $\Delta$  8 1017<sup>b</sup>23–26). It is usually but not always clear which of (1) or (2) is intended. See also Z 7 1032<sup>b</sup>2n.

**The account** (*logos*): See A 1 981<sup>a</sup>15n.

#### Note 59

**The matter or the underlying subject** (*hupokeimenon*): In addition to being (1) a subject of predication and (2) what underlies or persists through every change whether in attributes or in the coming to be or passing away (H 1 1042<sup>a</sup>32–<sup>b</sup>6, *Ph.* I 7 191<sup>a</sup>13–<sup>b</sup>10), a *hupokeimenon* can be (3) the subject matter of a science or body of knowledge (*NE* I 3 1094<sup>b</sup>12).

#### Note 60

**The cause opposite to this** (*tên antikeimenên aitian*): Opposite in the sense that the efficient cause is the beginning of the movement and the final cause its end. Compare, “what is most universal is furthest away [from perception], what is particular closest, and these are opposed (*antikeitai*) to each other” (*APo.* I 2 72<sup>a</sup>4–5). **The for-the-sake-of-which and the good**: See A 982<sup>b</sup>5–7,  $\alpha$  2 994<sup>b</sup>9–10, K 8 1065<sup>a</sup>26–22.

#### Note 61

**Our works on nature** (*tois peri phuseôs*): See *Ph.* II 3, 7.

#### Note 62

**Beings** (*onta*): *Onta* is a plural participle of the verb *einai* (“to be”). The beings here are or include the things that are or that fundamentally are—the *substances* (Z 1 1028<sup>b</sup>2–7).

**The truth**: The sort of truth about the nature of things and starting-points that philosophy seeks (A 7 988<sup>a</sup>19–20,  $\alpha$  1 993<sup>a</sup>30–<sup>b</sup>2, <sup>b</sup>17, 20).

#### Note 63

**Of those who first philosophized**: Reading  $\pi\rho\omega\tau\omega\nu$  with Primavesi for OCT  $\pi\rho\omega\tau\omega\nu$  (“of the first philosophers”).

**Kind** (*eidos*): *Eidos* sometimes means “form,” and is contrasted with *hylê* (“matter”), and sometimes means “species,” and is contrasted with *genos* (“genus”). But often, as here, *eidos*—as *genos* too—seems to have its more general meaning.

#### Note 64

**Element** (*stoicheion*): A *stoicheion* was originally one of a row (*stoichos*) of things and later a letter of the alphabet or an element of any complex whole (Plato, *Th.* 201e). Aristotle uses it in these ways, and to refer to the five primary elemental bodies (earth, water, air, fire, and ether), from which all others are composed: “Let an element of bodies be (1) that into which other bodies are divisible, (2) present (*enuparchon*) in them potentially or actually (which of the two is a matter of dispute), and (3) something that is itself indivisible into things of another kind

(*eidōs*). Something like this is what everybody in any context means by ‘element’” (*Cael.* III 3 302<sup>a</sup>15–19).

Note 65

**Unconditionally** (*haplōs*): The adjective *haplous* means “simple” or “single-fold.” The adverb *haplōs* thus points in two somewhat opposed directions. To speak *haplōs* sometimes means to put things simply or in simple terms, so that qualifications and conditions will need to be added later. Sometimes, as here, to be F *haplōs* means to be F in a way that allows of no “ifs,” “ands,” or “buts.” In this sense, what is F *haplōs* is F unconditionally speaking, or in the strictest, most absolute, and most unqualified way (Δ 5 1015<sup>b</sup>11–12), so that what is unconditionally F is what is intrinsically F (NE VII 9 1151<sup>b</sup>2–3).

**States** (*hexeis*): See A 5 986<sup>a</sup>17n.

Note 66

**Thales (of Miletus)**: See DK 11 = TEGP pp. 17–44.

**The hot itself comes to be from this**: “The sun, moving in the way it does—and by this movement causing there to be change as well as coming to be and passing away—causes the finest and sweetest water to be drawn up each day, to be dissolved into vapor, and to rise into the upper region, where it is then condensed and falls again to earth. Nature, as we said, always tends to operate in this way. So it is ridiculous to believe as some of our predecessors did that the sun is nourished by moisture” (*Mete.* II 2 354<sup>b</sup>26–34). The remainder of the passage (354<sup>b</sup>34–355<sup>a</sup>33) elaborates.

**What is alive lives by this**: Reading καὶ τὸ ζῶν τοῦτω ζῶν with Primavesi for OCT καὶ τοῦτω ζῶν (“and it lives by this”).

Note 67

**Some people**: Homer, *Iliad* XIV.201, 246 (parents), XV.37 (oath).

**Tethys**: ‘The daughter of earth and heaven and the sister of ocean’ (Hesiod, *Theogonies* 136).

**Styx**: Eldest of the daughters of ocean and Tethys. Later, the river in the Underworld.

Note 68

**What is oldest is most estimable**: See A 1 981<sup>a</sup>31n.

Note 69

**Hippo**: An eclectic philosopher of the time of Pericles (c. 495–428 BC), who also thought that the starting-point of things was water. He is also mentioned, again in a dismissive way, at DA I 2 405<sup>b</sup>1–5.

**With these** (*meta toutōn*): The reference is not to the theologizing poets but to Thales and the philosophers Aristotle is about to discuss.

Note 70

**Anaximenes (of Miletus)**: See DK 13 = TEGP pp. 72–94.

**Diogenes (of Apollonia)**: See DK 64 = TEGP pp. 434–461.

Note 71

**Hippasus of Metapontium**: An early Pythagorean. See TEGP Index.

**Heraclitus of Ephesus:** See DK 22 = TEGP pp. 135–200.

Note 72

**Empedocles (of Acragas):** DK 31 = TEGP pp. 326–433. Aristotle is probably paraphrasing DK B17 = TEGP 41 F20.

Note 73

**Anaxagoras of Clazomenae:** DK 59 = TEGP pp. 271–325.

Note 74

**Homoeomerous things:** Something is homoeomerous in the strict sense if its parts, however small, are of the same sort as the whole—as parts of water, however small, are (or were thought to be) water too (PA I 2 647<sup>b</sup>17–20).

Note 75

**The facts themselves . . . compelled them to inquire further:** See 984<sup>b</sup>10, A 5 986<sup>b</sup>31.

Note 76

**Cause of the change (*metabolē*) . . . starting-point from which the movement (*kinēsis*) comes:** A *kinēsis* in the broad sense is a change (*metabolē*) of any sort (Ph. III 1 210<sup>a</sup>8–9), and so is occasionally translated as “movement or change.” But sometimes a *kinēsis* is more narrowly a change of place, so that a coming to be (passing away) is a *metabolē* but not a *kinēsis* (Ph. V 1 225<sup>b</sup>7–9). Related to a *kinēsis* but importantly different from it is an *energeia* or activity (H 2 1042<sup>b</sup>10n).

Note 77

**As if defeated by this inquiry:** They were looking for a cause of movement, but, unable to find one, ended up denying change of any sort.

**Every other sort of change (*metabolē*):** The types of change Aristotle recognizes are: coming to be and passing away, change in magnitude, change of place, and alteration (Cat. 14 15<sup>a</sup>13–14). See also H 1 1042<sup>b</sup>5–6n.

Note 78

**The universe (*to pan*):** See A 1 1069<sup>a</sup>19n.

**A cause of this sort:** That is, a starting-point from which movement derives—an efficient or moving cause.

**Parmenides (of Elea):** See DK 28 = TEGP pp. 203–244.

**Insofar as he posited causes not only as one but also somehow as two:** Explained at A 5 986<sup>b</sup>27–987<sup>a</sup>2.

Note 79

**These sorts of starting-points:** That is, material causes that cannot initiate movement (earth, water, and air), and those that can (fire).

**As we said:** At 984<sup>a</sup>18–19.

**The next sort of starting-point:** That is, the efficient cause (A 4 985<sup>a</sup>10–13, <sup>b</sup>20–21).

Note 80

**The good or noble state:** See M 3 1078<sup>a</sup>31n.

Note 81

**Chance or luck:** See Z 7 1032<sup>a</sup>29n.

Note 82

**When one person said, then, that understanding was present . . . in nature too:**

Understanding (*nous*) is here a divine cosmic force.

**He seemed like a sober person:** Compare Plato, *Phd.* 97b–98b.

Note 83

**Hermotimus of Clazomenae:** A somewhat legendary figure, said to have been a previous incarnation of Pythagoras. “Humans possess nothing divine or blessed that is worth taking seriously except what there is in them of understanding (*nous*) and wisdom (*phronêsis*). For this alone of our possessions seems to be immortal, this alone divine. And as a result of being able to share in this capacity, our life, however wretched and harsh by nature, is yet managed in so refined a way that a human seems a god in comparison with other things. For understanding is the god in us—whether it was Anaxagoras or Hermotimus who said so—and mortal life contains a part of some god” (F61 R<sup>3</sup> = Barnes, pp. 2416).

**“Charged” (*aitian*):** An agent is *aition* if he is culpable, responsible, or to blame. An *aitia* is a charge brought against him accusing him of being culpable, responsible, or to blame. But it is also a cause or causal explanation (A 1 980<sup>a</sup>26n), suggesting that Aristotle is consciously punning on its double meaning.

Note 84

**As Parmenides also did:** See DK B13 = TEGP 29 F13. In Plato, *Smp.* 178a–c, the same Parmenidean text is cited as proof that love had no parents.

Note 85

**The universe (*tou pantos*):** See A 1 1069<sup>a</sup>19n.

Note 86

**Hesiod:** One of the oldest known Greek poets (c. 700 BC), author of the *Theogony*, *Works and Days*, and the *Catalogue of Women*. His works, like those of Homer, played a substantial role in Greek education. The quotation, which is based on *Theogony*, 116–120, is incomplete and differs from our text, suggesting that Aristotle is relying on memory.

Note 87

**As for the way these people should be arranged with regard to priority, let us leave it till later to discern:** A promise unfulfilled in our text of the *Metaphysics*.

Note 88

**Nobility (*to kalon*):** See M 3 1078<sup>a</sup>31n.

**Love:** *Philia* (“love,” “friendship”) is sometimes distinguished from *erôs* (“erotic love,” “passion”) but is here used as its equivalent.

## Note 89

**Love is the cause of good things and strife of bad ones:** See DK B17 = TEGP 41 F20, B21 = TEGP 45 F22, B35 = TEGP 51 F28, B122 = TEGP 183 F129, B115 = TEGP 25 F8.

## Note 90

**If indeed the cause of all good things is the good itself:** Deleting καὶ τῶν κακῶν τὸ κακόν ("and of bad ones, the bad") with OCT.

## Note 91

**In our works on nature:** See *Ph.* II 3, 7.

## Note 92

**Perspicuous way** (*saphôs*): "Beginning with things that are truly stated, but not perspicuously (*saphôs*), we proceed to make them perspicuous as well. . . . That is why even politicians should not regard as irrelevant to their work the sort of theoretical knowledge (*theôrian*) that makes evident not only the that, but also the why" (*EE* I 6 1216<sup>b</sup>32–39; also *APo.* II 2 10 93<sup>b</sup>37–94<sup>a</sup>14, *Ph.* I 1 184<sup>a</sup>10–23).

## Note 93

**Scientific knowledge:** "We speak of boxing and wrestling as branches of scientific knowledge" (*Cat.* 10<sup>b</sup>3–4).

## Note 94

**Deus ex machina** (*mêchanê*): Aristotle is probably thinking of the crane-like machine used in Greek theaters from which a god was suspended above the stage at the end of a play to tie things together in an artificial way. Hence our phrase *deus ex machina* ("god from the machine").

**Understanding** (*nous*): *Nous* starts the vortex movement responsible for cosmic order, but subsequent movements seem to be explained mechanically (DK B9 = TEGP 17 F6, B13 = TEGP 33, B15–16 = TEGP 35–36 F18–19). Compare Plato, *Phd.* 98b–c.

## Note 95

**Whenever the universe (to pan) is divided up into its elements (stoicheion):** On *to pan*, see A 1 1069<sup>a</sup>19n, and on *stoicheion*, A 3 983<sup>b</sup>11n.

## Note 96

**As we may gather from studying his verses:** DK B62 = TEGP 125 F76.

## Note 97

**Leucippus (of Miletus?) and his associate Democritus (of Abdera):** Second half of the 5th cent BC. See DK 67–68 = TEGP pp. 516–685.

**The body no more is than the void:** Reading τοῦ κενοῦ τὸ σῶμα with Ross and Primavesi for OCT τὸ κενὸν τοῦ σώματος ("the void no more is than the body"). The body = the full or the solid.

Note 98

**These differentiae, they say, are three—shape, order, and position:** See H 2 1042<sup>b</sup>11–15.

Note 99

**For they say that being is differentiated:** For Aristotle shape, order, and position are contraries, analogous to Empedocles' love and strife: "[Democritus] further posits position, shape, and order, and these are kinds (*genos*) of opposites: in the case of position, above, below, in front, behind; in that of shape, angular, angleless, straight, curved. . . . So that [he makes] the contraries into starting-points" (*Ph.* I 5 188<sup>a</sup>23–26). Also H 2 1042<sup>b</sup>11–15.

Note 100

**Carelessly neglected:** Careless neglect of one question is compatible with subtlety and sophistication on another: "The most methodical route of inquiry (*hodēf[i]malista*), however, which covers everything in a single account, is that of Leucippus and Democritus, who produce a starting-point that is in accord with nature" (*GC* I 8 324<sup>b</sup>35–325<sup>a</sup>2; also I 315<sup>a</sup>34–35, 316<sup>a</sup>13–14).

Note 101

**Among these thinkers:** These could be (1) the atomists (Leucippus, Democritus) or (2) the pluralists more generally. 986<sup>b</sup>9 seems to favor (2).

**The Pythagoreans:** See DK 14 (Pythagoras), 44 (Philolaus) = TEGP pp. 486–515, 47 (Archytas of Tarentum). Aristotle seems to draw primarily on Philolaus, although his monograph *On the Pythagoreans* (preserved in part in *Alex. In. Metaph.* 38.8–41.15 = Dooley I, 63–67) suggests that he also relied on other sources.

**The first to latch on to mathematics:** That is, the first to latch on to it as having a role to play in cosmology. Mathematics, in this instance, consisting of arithmetic, geometry, astronomy, and music theory. See Archytas of Tarentum, *Fl* 4–7 Huffman.

Note 102

**The numbers are by nature primary:** On whether these numbers are intelligible immaterial objects or material units, see A 6 987<sup>b</sup>11–14, 8 989<sup>b</sup>18–33, M 6 1080<sup>b</sup>16–21, 8 1083<sup>b</sup>8–19, N 3 1091<sup>a</sup>13–22.

**Such and such an attribute of number is justice:** "What resemblances they [the Pythagoreans] said there are in numbers to beings and things that come to be Aristotle showed [in his lost treatise *On the Pythagoreans*]. For since they assumed that reciprocity or equality is a property of justice, and found that this was in numbers, they therefore said that justice is the first equal-times-equal [that is, square] number. . . . But some said that this number is the fourth, since, as the first square number, it is divided in equals and is itself equal (for it is twice two), while others said that it is the ninth number, which is the first square number from an odd number (three) multiplied by itself" (*Alex. In Metaph.* 38.1 = Dooley I, 63–64).

**Such-and-such an attribute is soul and understanding:** We have no decisive evidence that Philolaus held a view of this sort, which may go back to earlier Pythagoreans.



**Appropriate time** (*kairos*): "They [the Pythagoreans] said, again, that the seventh number is appropriate time, for natural things seem to have their seasons of completion, both of birth and of maturity, according to [periods of] seven, as in the case of a human. For a human is born seven months [after conception], cuts his teeth after the same number of months, and reaches puberty at about the end of the second period of seven years, and grows a beard at about the end of the third" (Alex. *In Metaph.* 38.1 = Dooley 1, 64). See also A 8 990<sup>a</sup>23.

**Made like** (*aphômoiôsthai*): Compare, (1) "human beings model not only the forms [= shapes] of the gods on their own (*aphomoiousin*), but their way of life as well" (Pol. I 2 1252<sup>b</sup>26–27) and (2) "they must not get into the habit of modeling themselves on (*aphomoiousin*) madmen whether in words or in deeds" (Plato, *Rep.* III 386a3–4). When (1) a sane person models himself on a madman by acting and talking as if he were mad, he does not become a madman, though he *resembles* one in some respects. On the other hand, (2) when the shapes and ways of life of the gods are modeled on human ones they in fact do have human shapes and ways of life. *Aphômoiôsthai* is thus ambiguous. The term *mimêsis* ("imitation") which Aristotle also uses to characterize the Pythagorean relationship between things and numbers, is ambiguous in a parallel way (A 6 987<sup>b</sup>11n). It may be, then, that the Pythagoreans illegitimately inferred instantiation from resemblance or imitation, thinking that things were numbers because they resembled numbers. For, as Aristotle represents them (986<sup>a</sup>2, 15–21, <sup>b</sup>6–8, 987<sup>a</sup>13–19), they clearly did think that things were numbers. These numbers, as a result, must have spatial magnitude. Focus now on the first such number, the one. It "comes from" the limited and the unlimited, which are its elements (986<sup>a</sup>17–19). But how does it come from them? What about the limited guarantees that together with the unlimited it results in something with just that magnitude? Why, to sharpen the question, do the various ones or units that come from it all have the same size? This is the question Aristotle seems to be pressing at M 6 1080<sup>b</sup>16–21 (esp. 20–21). For unless we have an answer to it, we lose our reason for thinking that it is *number* that the units are instances of, and so lose our grip on what their being made like number means or amounts to (A 6 987<sup>b</sup>13–14).

**The whole heaven** (*ouranos*): "Let us first say what we mean by *ouranos* and how many senses it has. In one sense, then, [1] we mean by *ouranos* the substance of the outermost circumference of the universe, or the natural body that is on the last circumference of the universe, since more than anything else it is the last upper region that we usually call *ouranos*, the one in which we say that everything divine also has its seat. In another sense, [2] *ouranos* is the body that is continuous with the last circumference of the universe, in which we find the moon, the sun, and some of the stars, since we say that these bodies too are in the *ouranos*. Further, [3] we call *ouranos* the body that is encompassed by the last circumference, since we usually call *ouranos* the whole [cosmos] and the universe (*to holon kai to pan*)" (*Cael.* I 9 278<sup>b</sup>9–21). Here *ouranos* refers to [3] the universe (on which, see A 1 1069<sup>a</sup>19n).

# Note 103

**Whenever they found consistencies and harmonies in the numbers with the attributes and parts of the heaven and with the whole arrangement of the cosmos,**

they collected these together and fitted them into their scheme: “As for the sun and moon, and the stars, so many in number and so large in magnitude, all moving so fast, it is impossible, they thought, that they not produce a noise of incredible magnitude. Positing this, and that the speeds of the stars as judged by their distances are in the ratios of the musical consonances, they claim that the sound of the stars as they revolve is harmonious” (*Cael.* II 9 290<sup>b</sup>18–23).

## Note 104

**Anti-earth:** “[The Pythagoreans] claim that at the center [of the cosmos] there is fire, while the earth, which is one of the stars, by moving around the center in a circle produces night and day. Further, they contrive another earth opposite to this one, which they call by the name ‘anti-earth,’ not inquiring into accounts and causes that are suited to the things that appear to be so (*ta phainomena*), but adapting the things that appear to be so to suit certain of their accounts and beliefs” (*Cael.* II 13 293<sup>a</sup>20–27). See Philolaus of Croton DK 44 A16–17 = TEGP 27–28.

## Note 105

**Elsewhere:** In *Cael.* II 13, which discusses the position, movement, and shape of the earth.

## Note 106

**They too:** See A 4 985<sup>b</sup>10–15.

**States:** A state (*hexis*), in contrast with an attribute (*pathos*), which may be possessed quite fleetingly, is a relatively stable condition (*Cat.* 8 8<sup>b</sup>25–9<sup>a</sup>13), ensuring that a thing is “either well or badly disposed, whether intrinsically or relative to something—for example, health is a state, since it is a disposition of this sort” (*Δ* 20 1022<sup>b</sup>10–12). Compare A 3 984<sup>b</sup>11–22.

**The odd is limited and the even unlimited:** “The Pythagoreans identify the unlimited with the even. For this, they say, entrapped and becoming limited by the odd, gives beings their unlimitedness. An indication of this is what happens with the numbers. For when ‘gnomons’ are arranged around the one and separate (*kai chôris*), the form is always a distinct one in the latter case, and the same in the former case” (*Ph.* III 4 203<sup>a</sup>10–15). Though the meaning of the passage—especially of *kai chôris*—is disputed, a plausible interpretation is this. The one is both odd and even (986<sup>a</sup>20). It is represented by •, when odd, and by • and a separate • (that is, by • •), when even. Enclose • with a gnomon, which is like a carpenter’s set square (represented by lines). This gives Fig. 1 below. Now enclose • • with a gnomon. This gives Fig. 2.

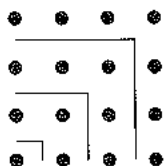


Fig. 1

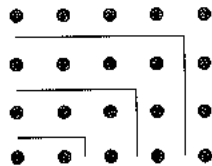


Fig. 2

In Fig. 1 a series of squares (square or even numbers) is generated, in Fig. 2 a series of rectangles (rectangular or odd numbers). The successive square or even

numbers (2, 4, 6, 8 . . .) generated from • (the one taken as odd) are all similar (=  $n^2$ ). The successive rectangular or odd numbers generated from • • (or the one taken as even) are all dissimilar, since the ratio  $n : n+1$  is different for all values of  $n$ . This may be why odd was associated with limit and even with unlimited.

#### Note 107

**The one comes from both of these (for it is both odd and even):** Philolaus refers to *apeira* or unlimited things (plural) and to *peiraionta* or limiters (plural), which are clearly cosmological principles—"The nature in the cosmos was constructed from unlimiteds and limiteds, both the whole world order and all the things in it" (DK B1 = TEGP 7 F1)—and brings in numbers as much in relation to knowledge as to cosmology: "And indeed all things that are known have number. For it is not possible that anything at all should be known or thought without this" (B44 = TEGP 12 F4). But he does seem to have thought of the one as coming from the unlimited things and the limiters: "The first thing to be harmonized—the one, in the middle of the sphere—is called the hearth" (B7 = TEGP 19 F8). Moreover, he seems to have conceived it (and perhaps some others) as being both odd and even: "Number has two kinds that are special to it, odd and even, and a third kind mixed from both, even-odd" (B5 = TEGP 14 F6).

**Number comes from the one** (*tou henos*): "The Pythagoreans too hold that there is a void and that it enters the heaven [= the cosmos] from the unlimited breath, as the heaven is also inhaling the void, which distinguishes the natures of things, since it is what separates and distinguishes the successive terms in the series. This happens first in the case of the numbers, since the void distinguishes their nature" (*Ph.* IV 6 213<sup>b</sup>22–27).

#### Note 108

**There are ten starting-points:** Whereas for the first lot of Pythagoreans there were only two, namely, the limited and the unlimited, from which numbers, and so all the other beings, were constructed.

**Arranged in two columns** (*sustoichian*): (1) Here, as at N 6 1093<sup>b</sup>12–13, *sustoichia* ("column," "line") refers to a Pythagorean classification of fundamental explanatory principles, the first column being that of good ones (*NE* I 6 1096<sup>b</sup>6), the second that of bad ones. (2) *Γ* 2 1004<sup>b</sup>27 refers to a column of opposites, one column consisting of "positive" notions, the other of "lacks," or privative ones. *K* 9 1066<sup>a</sup>15, *A* 7 1072<sup>a</sup>31 also refer to this, suggesting that it is a device or way of thinking that Aristotle himself accepts. (3) *Iota* 3 1054<sup>b</sup>35, 8 1058<sup>a</sup>13 refer to a different sort of *sustoichia*, which is a "line of predication (*sustoichia tês katêgorias*)" or, which seems to be the same thing, a "figure of predication (*schêma tês katêgorias*)" (3 1054<sup>b</sup>29, *A* 7 1017<sup>a</sup>23n).

#### Note 109

**Alcmaeon of Croton:** See DK 24. A phrase omitted by OCT and Ross at 986<sup>a</sup>30 (ἐπὶ γέροντι Πυθαγόρᾳ) describes him as flourishing "when Pythagoras was an old man."

Note 110

**The Pythagoreans:** That is, the sub-group of them now under discussion.

Note 111

**There are some, however, who made claims about the universe as being of a singular nature:** See A 1 1069<sup>a</sup>19n.

**In accord with the facts of nature:** Reading τοῦ κατὰ τὴν φύσιν with Ross and Primavesi for OCT τοῦ κατὰ φύσιν (“in accord with nature”).

Note 112

**An account of these thinkers is in no way appropriate to our present investigation of causes:** “To investigate whether being is one and immovable is not to investigate nature. For just as a geometer has no further argument against someone who does away with the starting-points of geometry . . . , so it is when we are investigating starting-points. For there will be no further starting-point if being is one thing only and one in this way, since a starting-point must be a starting-point of some thing or things” (*Ph.* I 1 184<sup>b</sup>25–185<sup>a</sup>5).

Note 113

**Physicists** (*phusiologoi*): The *phusiologoi* were thinkers who tried to give a general account of reality that, among other things, made no reference to incorporeal beings (A 8 988<sup>b</sup>24–26).

Note 114

**The universe comes into being:** See A 1 1069<sup>a</sup>19n.

Note 115

**Parmenides (of Elea):** See DK 28 = TEGP pp. 203–244.

**One in account** (*kata ton logon*): A and B, which are two numerically distinct things, are one in account, if and only if the account of A = the account of B.

**Account:** See A 1 981<sup>a</sup>15n.

**Melissus of Samos:** See DK 30 = TEGP pp. 462–85.

**Melissus that it is unlimited:** See DK B6 = TEGP 14 F6.

**Xenophanes of Colophon:** See DK 21 = TEGP pp. 95–134.

**Heaven as a whole:** See 986<sup>a</sup>3n.

Note 116

**In our works on nature:** See *Ph.* I 3.

Note 117

**Things that appear to be so** (*ta phainomena*): *Phainomena* are things that appear (often to perception) to be so, but that may or may not be so. The corresponding verb *phainesthai* (“appear”), when used with a participle endorses what appears to be so and is translated “it is evident that,” “or it is seen to be that,” or the like, and when used with an infinitive it neither endorses nor rejects what appears to be so and is translated “appears.” When it occurs without a participle or an infinitive, it may either endorse or reject. Things that appear so to everyone or to wise people who have investigated them are *endoxa* or reputable beliefs. The role of

both *phainomena* and *endoxa* are discussed at NE VII 1 1145<sup>b</sup>2–7 (quoted in the Introduction, p. xlix). Compare A 3 984<sup>a</sup>18–19, <sup>b</sup>10.

**According to reason:** *Kata ton logon*, as at 986<sup>b</sup>19, where it is translated “in account,” but here, since it is contrasted with “according to perception,” it seems to mean “according to reason.” See again A 1 981<sup>a</sup>15n.

**Now posits two causes and two starting-points:** See A 3 984<sup>b</sup>3–4.

**Fire and earth:** Parmenides’ terms are *pur* (“fire”) and *nux* (“night”). See DK B8.56–59 = TEGP 17 F8.56–59.

#### Note 118

**Movement:** See A 3 984<sup>a</sup>27n.

#### Note 119

**The Italians:** That is, the Pythagoreans. Also A 6 987<sup>a</sup>31, 988<sup>a</sup>26, *Cael.* II 13 293<sup>a</sup>20, *Mete.* I 6 342<sup>b</sup>30.

**Rather vaguely:** Reading *μηνυχώτερον* with OCT. Some mss. have *μετριώτερον* (“in a rather measured or moderate way”). Primavesi reads *μοναχώτερον* (“in a rather monistic way”). See Alex. *In Metaph.* 46.23–24 = Dooley 1, 73.

**Some made the second of them (the one from which the movement derives) one, others two:** See A 4 985<sup>a</sup>30–31.

#### Note 120

**In the same way:** The Pythagoreans made their starting-point two (the limited and the unlimited) in the way that some of their predecessors made their starting-point two (the hot and the cold, love and strife, full and void).

#### Note 121

**They thought that the limited and the unlimited were not certain distinct natures** (*ouch heteras tinas . . . phuseis*): For the meaning of the phrase *ouch heteras tinas phuseis*, see 987<sup>b</sup>23n.

**The substance of the things of which they were predicated:** On Aristotle’s view substance is an ultimate subject of predication (A 3 983<sup>a</sup>27n). For the pre-Pythagoreans, the elements (fire, earth, and the rest) were the substances or ultimate subjects and other beings, as modification of these, were predicated of them. The Pythagoreans, like the Platonists discussed in A 6, reversed this. Their starting-points, the limited and unlimited (or the one, which comes from both), were predicated of other things as the substance of them. Philolaus is, again, a likely source here: “The being [or essence] (*estô*) of things, because it is eternal, and nature in itself admits of divine but not human knowledge—except that it is not possible that any of the things that exist and are known by us to have come to be could have come to be unless the being [or essence] of things from which the cosmos was composed, exists, namely, the limiters and the unlimiteds [which are] . . . starting-points” (DK B6 = TEGP 11 F3).

#### Note 122

**The what-it-is** (*to ti esti*): When we ask *Ti esti A*? we ask What is A? The correct answer defines or makes clear the what-it-is of A, or—a related notion—the being for A, or—another related notion—the essence or what-it-was-to-be of A (A

3 983<sup>a</sup>27n). Any intrinsic being, regardless of its category, has a what-it-is ( $\Delta$  7 1017<sup>a</sup>23n), although not all in the same unconditional way (Z 4 1030<sup>a</sup>17–27).

**And so (kai) about the what-it-is they also started to speak and to give definitions:** I take the initial *kai* (“and”) to draw an inference. Because their starting-points were predicative beings that gave the substance of the things they were predicated of, the Pythagoreans, in speaking of them that way, had begun to speak of the what-it-is of those things and of definitions.

**Give definitions (horizesthai):** A common meaning of the noun *horos*, from which *horizesthai* derives, is “term,” in the logical sense, in which a syllogism has three terms. But often a *horos* is a definition or a defining mark (a boundary marker is a *horos*) that gives definition to what would otherwise lack it (*Pol.* I 9 1258<sup>a</sup>18, II 8 1267<sup>a</sup>29, VII 4 1326<sup>a</sup>35). Definition is discussed in Z 12.

### Note 123

**The first subject to which a given definition applied, this they believed to be the substance of the thing:** “If, for instance, they happened to call friendship ‘equality,’ and for this reason supposed that the account [or definition] of friendship is ‘equal-times-equal,’ they said that the first number of which this definition is predicated is friendship” (*Alex. In Metaph.* 48.17–21 = Dooley 1, 73).

### Note 124

**Cratylus:** Little is known about Cratylus beyond what Aristotle tells us about him here and at  $\Gamma$  5 1010<sup>a</sup>7–15, and what we can glean from Plato’s *Cratylus*. Other sources tell us that Plato’s association with Cratylus occurred after the death of Socrates in 399 BC (*DL* III [6] 57–60).

**All perceptibles are always flowing (hapantôn tôn aisthêtôn aei rheontôn):** “Heraclitus says somewhere that ‘everything gives way (*panta chôerei*) and nothing stands fast,’ and likening the beings to the flowing (*rhoêfi*) of a river, he says that ‘you cannot step into the same river twice.’” (Plato, *Crat.* 402a8–10). He may be recalling, “On those stepping into rivers staying the same other and other waters flow” (DK B12 = TEGP 62 F39), which says something less extreme. Two other formulations come closer to Aristotle’s: “The things themselves . . . , they think, are never stable or steadfast, but flowing and moving, full of every sort of motion and constant coming to be” (411c2–5); “everything is always moving and flowing” (439c2–3). Plato also discusses Heraclitean views at *Thi.* 179c–181b.

**There is no scientific knowledge concerning them:** Not a view we find in the extant fragments of Heraclitus, although Socrates does infer it from the view that *all things*—not just perceptibles but Forms too—are flowing (*Crat.* 439b–440b).

**These views:** See M 4 1078<sup>b</sup>13–17, 9 1086<sup>a</sup>37–<sup>b</sup>2, where Cratylus is not mentioned.

### Note 125

**It is impossible for there to be a common definition of any perceptibles, as they at any rate are always changing:** Aristotle draws a similar inference at Z 15 1039<sup>b</sup>20–1040<sup>a</sup>7.

**Common definition:** Another way of referring to a universal definition. See “common universal” at NE I 6 1096<sup>a</sup>28 (also VI 6 1140<sup>b</sup>31, X 9 1180<sup>b</sup>14–16).

## Note 126

**Ideas:** Ideas (capital “I”) = Platonic Forms (capital “F” to distinguish them from Aristotelian forms).

**The perceptible ones are beyond these:** See M 4 1078<sup>b</sup>30–32, 9 1086<sup>b</sup>2–5.

## Note 127

**The many things that have the same name as (*sunōnumōn*) the Forms:** Reading τὰ πολλὰ τῶν συνωνύμων [ὁμώνυμα] with Primavesi for OCT τὰ [πολλὰ τῶν συνωνύμων] ὁμώνυμα (“the things that have the same name”). Aristotle sometimes uses *sunōnumōn* in a technical sense, which he defines as follows: “Things are said to be *homonymous* when they have only a name in common, but the account of the substance [= essence] that corresponds to the name is distinct—for example, both a human and a picture are animals. These have only a name in common and the account of the essence corresponding to the name is distinct. For if we are to say what it is for each of them to be an animal, we will give a special account to each. Things are said to be *synonymous* when they have a name in common and when the account of the essence that corresponds to the name is the same—for example, both a human and an ox are animals. Each of these is called by a common name ‘animal,’ and the account of the essence is also the same, since if we are to give the account of what it is for each of them to be an animal, we will give the same account” (*Cat.* 1 1<sup>a</sup>1–12). It is unlikely, however, that he is using the term in this sense to describe Plato’s views, since he has just said that the universal definitions (the accounts of the essence) that apply to Forms cannot apply to perceptibles. More than likely, he means no more than that perceptibles have the same name as the correlative Forms. Plato himself usually characterizes perceptibles as homonymous (*homonumos*) with the correlative Forms (*Prm.* 133d3, *Ti.* 52a5, *Sph.* 234b7).

## Note 128

**As for participation, Plato changed only (*monon*) the name:** This characterization seems unfairly to belittle Plato’s contribution. Some mss. delete *monon*, perhaps to diminish its unfairness. The topic, however, is the narrow one of the relation R between perceptibles and Forms (numbers). The Pythagoreans give the name “imitation” to R, without adequately explaining R itself, letting the ordinary meaning of “imitation” (inadequately) do the work for them. Plato gave R the name “participation,” also without adequately explaining R itself. Moreover, the term he chose to capture R is as inadequate as “imitation,” suffering perhaps from similar ambiguities, and needing to be supplemented by further analysis that was not forthcoming.

## Note 129

**The Pythagoreans say that beings are [what they are] by imitating (*mimēsei*) the numbers:** (1) A person X can imitate Y by playing the part or role of Y (Plato, *Rep.* III 393c4–5) or (2) a painting X can imitate Y by portraying Y (*Rep.* X 598b6–c4). In (1) X comes closer to instantiating Y or constituting Y, which is how the Pythagoreans were earlier characterized as thinking of numbers in relation to other things (A 5 985<sup>b</sup>33n).

## Note 130

**Apart from the perceptibles and the Forms are the objects of mathematics, he says:** In the dialogues, Plato does not say this, although he might perhaps be reasonably taken to imply it (*Rep.* VII 525c–526b, *Phlb.* 56c–e, *Thi.* 198a–d).

**Objects of mathematics:** “Numbers, lines, and the like” (M 1 1076<sup>a</sup>17–19). Also referred to at B 1 995<sup>b</sup>16–18, Z 2 1028<sup>b</sup>19–21.

**Intermediate between them (*metaxu*):** Objects of mathematics as intermediate things, lying between Forms and perceptibles, are referred to at 987<sup>b</sup>29, A 9 991<sup>a</sup>4, 991<sup>b</sup>29, 992<sup>b</sup>16, B 1 995<sup>b</sup>17, 2 997<sup>b</sup>2, 998<sup>a</sup>7, 6 1002<sup>b</sup>13, 21, K 1 1059<sup>b</sup>6, A 1 1069<sup>a</sup>34, M 1 1076<sup>a</sup>19, 2 1077<sup>a</sup>11, N 3 1090<sup>b</sup>35, and is attributed explicitly to Plato at Z 2 1028<sup>b</sup>19. The intermediate status of the objects of mathematics is perhaps implied by the Line analogy in *Rep.* VI 509d–511e, where the intelligible realm is divided between Forms, which are grasped by understanding (*noēsis*), and the objects of mathematics, which are grasped by thought (*dianoia*).

## Note 131

**It is as matter, then, that the great and the small were starting-points:** “What is encompassed and given definition by the form, as by a surface and a limit, is the sort of thing that matter and the indefinite are. For when the limit and the attributes of a sphere are abstracted away, nothing is left but the matter. That is why Plato too says in the *Timaeus* that matter and space are the same thing, since ‘the participative (*to metalēptikon*)’ and space are one and the same. Although, he spoke of the participative in a different way in the so-called unwritten doctrines, nonetheless he still declared that place and space were the same thing” (*Ph.* IV 2 209<sup>b</sup>7–16); “we should ask Plato why the Forms and the numbers are not in place, if indeed place is the participative, whether the participative is the great and the small or whether it is matter, as he writes in the *Timaeus*” (209<sup>b</sup>33–210<sup>a</sup>2). This suggests that Aristotle is drawing on the unwritten doctrines in attributing the great and the small as a material starting-point to Plato, who does, however, describe the unlimited as “the more and the less” (*Phlb.* 24c–d).

## Note 132

**For generated [as they are] from the great and the small by participating in the one, the Forms are the numbers:** Reading τὰ εἶδη εἶναι τοὺς ἀριθμούς for OCT τὰ εἶδη εἶναι [τοὺς ἀριθμούς] (“they are the Forms”) and Ross [τὰ εἶδη] εἶναι τοὺς ἀριθμούς (“they are the numbers”), and treating the previous clause ἐξ ἐκείνων γὰρ κατὰ μέθεξιν τοῦ ἑνὸς as explanatory. Compare: “The numbers, though they are the Forms themselves and the starting-points, are nevertheless generated from the elements” (*DA* I 2 404<sup>b</sup>24–25). These numbers are not the objects of mathematics (or so-called mathematical numbers), however, which are between Forms and perceptibles, but the so-called Form (or Ideal) numbers (M 6 1080<sup>a</sup>11–14, 8 1083<sup>a</sup>21–35, N 3 1090<sup>b</sup>32–1091<sup>a</sup>5). M 4 1078<sup>b</sup>9–12 suggests that the identification of Forms with numbers was a later development in the account of Forms. In the dialogues, in any case, the identification is again not explicitly stated. In his lost lectures *On the Good*, on the other hand, Plato is thought to have identified the good-itself with



the Form number one—a view Aristotle also attributes to him (988<sup>a</sup>14, N 4 1091<sup>b</sup>13–15, EE I 8 1218<sup>a</sup>25–30).

### Note 133

**The one is substance and is not by being another thing said to be one** (*mê heteron ge ti on legesthai*): “When I say that the log is white, I do not say that another thing (*heteron ti*) is white and that thing is coincidentally a log. . . . The log is the underlying subject, which is just what came to be white, without being another thing (*heteron ti*) than just what is a log or a particular log” (APo. I 22 83<sup>a</sup>9–14; also I 4 73<sup>b</sup>5–10). As the log is intrinsically a log (but coincidentally white), so the one is one not because it is coincidentally another thing A and A is intrinsically one, but because it is itself intrinsically one.

**Like the Pythagoreans:** See A 5 987<sup>a</sup>17–19.

### Note 134

**The numbers are apart from the perceptibles:** That is, the Form numbers (987<sup>b</sup>22). **Do not place the objects of mathematics between them:** That is, between the perceptibles and the Form numbers, or Forms.

### Note 135

**The fact that he made the one and the numbers be beyond the things, not treating them as the Pythagoreans did, and that he introduced the Forms, were due to his investigation of accounts** (*logois*) **(for the previous thinkers had no share of dialectic** (*dialektikês*)): Dialectic is a descendant of the Socratic elenchus, which asks for an account or definition of what A is that (1) reliably and correctly picks out particular cases of A and (2) picks out that feature of A's that makes them A's or explains why they are A's (Plato, *Euthphr.* 6d9–e6), and then tests candidate accounts to see whether they succeed in doing these two things. Plato rejects mathematics as a source of genuine knowledge, because it treats its starting-points as hypotheses but gives no account of them—no defense of them against elenctic objection (*Rep.* VI 510c2–511a9). He introduces dialectic as what does provide such a defense, and introduces Forms as the ontological correlates of the accounts it defends (VI 511b3–c2, VII 532a1–533b1, 537c1–7). See Introduction pp. xlii–l.

### Note 136

**For as things stand they:** Reading *vũv mèv yãp* with Primavesi for OCT *oĩ mèv yãp* (“For they”).

### Note 137

**The fact that he made the one and the numbers . . . imitations of those starting-points:** Throughout this paragraph the numbers referred to are the Form numbers (= Forms), which are composed of the one (as substance) and the large and the small (as matter). Here the one (as Form) generates the Form of a table (say), of which there can be only one (987<sup>b</sup>18), from the great and the small (as matter). Aristotle's objection is that if we look at actual cases of generation (of form being imposed on matter), such as in the manufacture of tables, we have a one-many

relation between form and matter (the carpenter imposes the form of a table on different bits of wood to make many particular tables each with the same one form) and an efficient cause (the carpenter) that is different from the formal one. Yet these actual cases are supposed to be what they are by “imitating”—that is, “participating in” (Aristotle takes it that one name is as good or bad as the other)—the associated Form.

Note 138

**He made use of only two causes:** A puzzling claim (repeated at A 7 988<sup>a</sup>33–34), since in addition to material and formal causes Plato also seems to recognize efficient causes, such as the divine craftsman or demiurge (*Sph.* 265b–e, *Ti.* 28c–29a), the soul (*Phdr.* 245c–d, *Lg.* X 891c–899d), and the cause of the mixture of the limited and unlimited (*Phlb.* 23d, 26e–27c), and final causes, such as the good aimed at by the divine craftsman or other such cosmic makers (20d, 53e, *Ti.* 29d–30c, *Lg.* X 903c). Perhaps Aristotle should be understood to mean that Plato uses his ultimate starting-points (the one and the great and the small) as material and formal causes only. Reasons to think that Plato’s Form of the good is not a satisfactory final cause are given at NE I 6 1096<sup>b</sup>31–1097<sup>a</sup>8.

Note 139

**And the one in the case of the Forms:** Again, a puzzling claim, since if the one generates the Forms from the very same thing (the great and the small) that the Forms use to generate perceptibles, it follows, as Aristotle notices (*Ph.* IV 2 209<sup>b</sup>33–210<sup>a</sup>2), that the Forms are in perceptible space rather than being apart from it, as Plato claims.

Note 140

**He has assigned the cause of good and bad to both elements, one to each:** That is, he made the one the cause of good, the great and the small (= matter = the unlimited) the cause of bad. In the dialogues Plato does not say that Form (the one) is the cause of good or that matter is the cause of bad, but he might be thought to imply it or something like it. At *Phlb.* 25e–26b, for example, he seems to make limit (= Form) the cause of good.

Note 141

**The truth:** See A 3 983<sup>b</sup>3n.

Note 142

**Our works on nature:** See A 3 983<sup>a</sup>24–33.

Note 143

**Denser than fire and finer-grained than air:** It is unclear who held this view, which is also mentioned without specific attribution at *Ph.* I 4 187<sup>a</sup>14, *GC* II 1 328<sup>b</sup>35, 5 332<sup>a</sup>21.

**The starting-point from which movement derives:** That is, the so-called efficient cause. See A 3 984<sup>a</sup>27n.

## Note 144

**The essence and the substance:** That is, the formal cause, a vestigial grasp on which is also credited to Empedocles (A 10 993<sup>a</sup>17–24) and Democritus (PA I 1 642<sup>a</sup>13–31).

## Note 145

**Those who say that the one or being is such a nature:** That is, a cause posited as good (N 4 1091<sup>b</sup>13–15).

## Note 146

**The starting-points must be looked for in all these ways or in some of them:** That is, any or all of the four sorts of causes may be ultimate starting-points.

## Note 147

**Let us next go through, so far as possible, the puzzles (*tas endechomenas aporiiai*) about these:** Or, “the possible puzzles about these.”

**The puzzles (*aporiiai*):** “A dialectical problem (*problēma*) is a subject of inquiry . . . about which [1] people have no belief either way, or [2] on which the many have a belief contrary to that of the wise, or [3] the wise contrary to that of the many, or [4] about which the members of either of these classes disagree among themselves. . . . Problems also occur [5] where deductions conflict, since there is a puzzle about whether the thing holds or not, because there are strong arguments on both sides. They occur, too, [6] where we have no argument because they are so vast, and we find it difficult to give an explanation—for example, is the universe eternal or not? For one may also inquire into problems of that sort” (*Top.* I 11 104<sup>b</sup>1–17). Thus a problem is [5] a *puzzle* just in case there are strong arguments on one side of it and strong arguments on the other: “A certain sophistical argument constitutes a puzzle. For because they wish to refute in a way that is contrary to beliefs in order to be clever when they engage in ordinary discussions, the resulting deduction turns into a puzzle. For thought is tied up when it does not wish to stand still, because what has been concluded is not pleasing but cannot move forward, because of its inability to resolve the argument” (NE VII 2 1146<sup>a</sup>21–27).

## Note 148

**The universe (*to pan*):** See A 1 1069<sup>a</sup>19n.

## Note 149

**Incorporeal ones are also beings:** Reading ὄντων καὶ ἀσωμάτων, which OCT brackets for deletion.

## Note 150

**Physical account (*phusiologeîn*):** The sort of account characteristic of the *phusilogoi* (A 5 986<sup>b</sup>14n).

## Note 151

**None of those who say that it is one:** The reference of “it” could be the universe (988<sup>b</sup>22) or the element of bodies (989<sup>a</sup>4).

Note 152

**Why don't they also say earth:** If both aggregation and disaggregation are recognized, why favor the least aggregated body (fire) over the most aggregated one (earth), since if earth is maximally aggregated fire, it is equally true that fire is maximally disaggregated earth?

Note 153

**Hesiod too says:** *Theogony* 116, quoted at A 4 984<sup>b</sup>28.

**The supposition:** Namely, that earth is the element of bodies.

Note 154

**If what is posterior in coming to be is prior in nature:** “The order of coming to be and that of substance are opposed. For what is posterior in the order of coming to be is prior in nature, and that which is first in nature is last in coming to be” (*PA* II 1 646<sup>a</sup>24–28). Thus if water comes to be from air by aggregation or concoction, water is posterior in coming to be but prior in nature to air. Also *Z* 16 1040<sup>b</sup>5–10. **Concocted** (*pepemmenon*): Concoction (*pepsis*) involves more than mere aggregation, if this is simply compaction or condensation (*Z* 16 1040<sup>b</sup>9n). It is mentioned, apparently, not as something the material monists under consideration in fact recognized but rather as a way of explaining how we might justify attributing priority to something other than fire. First, employ concoction rather than aggregation, since aggregated or condensed air (= water) cannot plausibly be understood as prior even in nature to air (it is just condensed *air* after all). Second, recognize natural priority in addition to priority in coming to be.

Note 155

**Empedocles says that the matter is four bodies. For he too necessarily incurs consequences, some of which are the same as before, while others are special to him:** [1], that he has no account of incorporeal things, and [3], that he does not posit the substance, or essence, as a cause, apply to him, whereas [2], that he does away with the cause of movement, does not apply to him, since he acknowledges two efficient causes, even if his view of them is problematic (989<sup>a</sup>25–26). [4] may apply to him to some extent, since it implies that there are problems with assigning priority to elements other than fire (least aggregated, most disaggregated) or earth (most aggregated, least disaggregated) and so with assigning priority to all four elements.

Note 156

**Our works on nature:** In *Cael.* III 6 Aristotle develops this criticism of Empedocles in greater detail, showing that it does not depend on observation alone, as he might seem to suggest here. In *GC* II 1–4 he develops his own account (*Z* 16 1040<sup>b</sup>9n on concoction). Aristotle agrees with Empedocles that earth, water, air, and fire are the simple sublunary bodies, but not that they are irreducible elements or material causes.

Note 157

**Neither correctly nor altogether reasonably:** See A 4 985<sup>a</sup>23–29.

## Note 158

**Do away with alteration:** Aristotle's example focuses on those qualities (hot, cold, moist, dry) that differentiate the four elemental bodies, so he may intend his criticism to apply primarily or exclusively to them.

## Note 159

**If we too take Anaxagoras to say that there are two elements:** The two are understanding (*nous*) and the primordial mixture, containing an infinite number of homoeomerous things (A 4 985<sup>18</sup>–19, 7 988<sup>28</sup>). Here both seem to be treated as material causes (989<sup>19</sup>–20), though earlier understanding is treated as an efficient and final cause (3 984<sup>15</sup>–22). No doubt Aristotle saw it as having a tincture of each (7 988<sup>22</sup>–23).

## Note 160

**They must have been unmixed before the start:** Since Anaxagoras says that at the start “all things were (*ên*) [mixed] together” (59B1 = TEGP 11 F1) not that they *had been* mixed (*michthai*), it is not clear that he is subject to this objection, nor is it clear that Aristotle consistently thought that he was, since at *Cael.* III 2 301<sup>11</sup>–12 he is described as “starting cosmic production from unmoved things (*akinêton*).”

**A random thing cannot naturally be mixed with a random thing:** Aristotle distinguishes between a mere combination (*sunthesis*) or mechanical mixture and a chemical one (*mixis*), which involves the formation of a new homogeneous stuff with new emergent attributes: “mixture (*mixis*) is unification of the mixables, resulting from their alteration” (GC I 10 328<sup>22</sup>). Random things cannot mix, in this sense, but Anaxagoras' primordial mixture may be no more than a mechanical one. **Attributes—even [intrinsic] coincidents (*ta pathê kai ta sumbebêkota*)—would be separated from substances:** As at B 1 995<sup>20</sup> *ta sumbebêkota* are probably *ta kath' hauta sumbebêkota*—the intrinsic coincidents—which are demonstrable from the definitions of the essences of the substances whose attributes they are, and so are especially inseparable from those substances. Anaxagoras' primordial mixture contains “seeds” not just of Aristotelian substances but of their attributes as well: “Before these things were separated, when they were all [mixed] together, not so much as color was clear to see. For the mixture of all things prevented it, of the wet and the dry, the hot and the cold, and of the bright and the dark, and much earth was in it and seeds countless in number which were not at all like each other” (DK B4(b) = TEGP 13 F4). When the things of which there are seeds in the mixture get separated out from each other, then, it seems that attributes will be separate from substances, something Aristotle thinks to be impossible: “none of the other things besides substance is separate, for all of them are said of substance as of a subject” (*Ph.* I 2 185<sup>31</sup>–32; also Δ 8 1017<sup>13</sup>–14). On what separability amounts to for substances, see Z 1 1028<sup>34n</sup>.

## Note 161

**Nor some what (*ti*):** That is, something that would answer the question, *Ti esti?* or What is it? by specifying to *ti esti* or the what-it-is (A 5 987<sup>20n</sup>).

Note 162

**One of the particular forms would have belonged to it . . . it would have been separated out:** If the primordial mixture had color, it would have to have some particular color and not the others, with the result that that color would be separated out from the others. But because it has all of the colors mixed together, it does not have a particular one, and so is not colored at all. Similarly for all the others.

Note 163

**Which is such as we posited the indefinite (to aoriston) to be:** Aristotle earlier posited that Plato made the Pythagorean unlimited (to apeiron) a dyad, which he later refers to as the “indefinite dyad (aoristos duas)” (for example, M 7 1081<sup>a</sup>14, 22).

Note 164

**And now appears more and more to be the case:** Aristotle’s own account, in which matter (*hylê*) is an analogue of the indefinite and form (*morphê*) of the one, is an example.

**Now appears:** Reading  $\nu\upsilon\nu$ , which OCT brackets for deletion.

Note 165

**Physicists:** See A 5 986<sup>b</sup>14n.

Note 166

**Those with which astronomy is concerned:** See A 5 985<sup>b</sup>24n.

Note 167

**The so-called heaven:** See A 5 986<sup>a</sup>3n.

**The various (allois) physicists:** *Allos* is used here, as at Z 1 1028<sup>a</sup>34, to mean not “other”—which would here carry the (false?) suggestion that the Pythagoreans were physicists—but “various.”

Note 168

**The causes and starting-points they mention are, as we said:** At 989<sup>b</sup>31.

**Adequate to go up even to higher beings (ta anôterô tôn ontôn):** The phrase *ta anôterô tôn ontôn* sometimes refers to universals rather than particulars: “I mean by upward (*anô*), toward what is more universal, and by downward toward what is particular (*kata meros*)” (*APo.* I 20 82<sup>a</sup>23–24). But here Aristotle seems to be recalling Plato, *Rep.* VII, where an education in mathematics is prescribed for the philosopher-kings because “it gives the soul a strong lead upward (*anô*)” (525d5–6), “compels one to look at being” (526a8), provides “knowledge of what always is, not of something that comes to be and passes away” (527b4–5), drawing “the soul toward truth and producing philosophical thought by directing upward what we now wrongly direct downward” (527b8–10).

Note 169

**The heaven:** See A 5 986<sup>a</sup>3n.

## Note 170

**They are speaking no more about mathematical bodies than about perceptible ones:** The Pythagoreans were focused primarily on nature (989<sup>b</sup>33–34), and so did not intend their starting-points to be more about the objects of mathematics than about perceptible ones. At the same time, they thought these starting-points were adequate for explaining perceptible bodies and their features (such as weight), and so did not see a need to introduce fire, earth, and so on as starting-points special to such bodies.

## Note 171

**Belief and appropriate time are found in such-and-such a part of the cosmos:** See A 5 985<sup>b</sup>26–30n.

## Note 172

**The intelligible numbers are causes, whereas the other ones are perceptible:** The intelligible objects are the ones identical to the Forms (N 3 1090<sup>b</sup>36), the others are not the intermediates but “numbers attached to visible or tangible bodies” (Plato, *Rep.* 525d7)—for example, “two armies or two herds of cattle” (*Phlb.* 56d11).

## Note 173

**As for those who posited the Ideas as causes:** 990<sup>b</sup>2–991<sup>b</sup>8 = M 4 1078<sup>b</sup>34–1079<sup>b</sup>3. **As if a person who wished to count the beings were to think that he would not be able to do it while there were so few of them, and so tried to count them by making more:** The implied argument seems to be a version of Occam’s Razor. If the causes introduced to explain “the things that exist here” are as numerous as the (sorts of) things themselves, they are not going to do an effective explanatory job, so that entities will have been multiplied without necessity.

## Note 174

[1a] Those who posited the Ideas as causes, first, [1a] in looking to find the causes of the beings that exist here, they introduced others, equal in number to these: Aristotle develops this objection at 991<sup>a</sup>8–991<sup>b</sup>9.

## Note 175

[1b] In each case there is something that has the same name, both among the other things of which there is a one over many and beyond the substances, both over the things that exist here and over the eternal things: “[Socrates] Do you want us to begin our investigation with the following point, then, in accord with our usual method? I mean, as you know, we usually posit some one particular Form in connection with each of the manys (*hekasta ta polla*) to which we apply the same name. Or don’t you understand? [Glaucón] I do. [S.] Then, in the present case, too, let us take any of the manys you like. For example, there are surely many couches and tables. [G.] Of course. [S.] But the Ideas connected to these manufactured items are surely just two, one of a couch and one of a table” (Plato, *Rep.* X 596a5–b2). If Aristotle is thinking of passages like this, it is natural to take “the things that exist here” to be things like the many couches (in other words, *types* of things rather than *tokens* of those types). There are also manys, however, whose

members are eternal things. The one that is over both sorts of manys is a Form that has the same name as the corresponding type, with the result that there are as many Forms as there are types. The “substances” that these Forms are beyond are the particular token couches and tables that, in Aristotle’s view, are the most familiar examples of primary substances—ontologically primary beings on which others depend for their existence (A 3 983<sup>27n</sup>). The Forms are “beyond” these in the strong sense of being separate—ontologically independent—of them (M 4 1078<sup>31</sup>). This argument is invalid in Aristotle’s view (“no necessary deduction is generated”) because he thinks that it does not follow from the fact that the F’s that exist here have something in common in virtue of which they are called “F’s” that there is a separate Form of F. There is perhaps a hint, too, of a further objection in the reference to eternal manys, since these seem to generate Forms that are beyond (separate from) the Forms that are themselves beyond the manys that exist here.

#### Note 176

**Of the ways in which we show (*deiknumen*) that there are Forms:** “The words ‘we show’ reveal that in stating the doctrine of Plato, Aristotle is speaking as if in reference to his own beliefs. For it is not as someone refuting another’s arguments and doctrines, but as someone testing and critically examining his own beliefs, that he refutes [Plato] in order to discover the truth” (Alex. *In Metaph.* 78.1–4 = Dooley 1, 114). The present active indicative used here is replaced by the present middle passive indicative *deiknutaí* (“of the ways in which it is shown”) at M 4 1079<sup>5</sup>.

#### Note 177

**Deduction (*sullogismos*):** When a deduction is a syllogism proper (also *sullogismos*) it consists of a major premise, a minor premise, and a conclusion, where the premises have exactly one “middle” term in common, and the conclusion contains only the other two “extreme” terms (A 1 981<sup>3n(3)</sup>). At *APr.* 1 32 47<sup>33–35</sup> a syllogism is distinguished from a “necessity” (or what we would call a valid deduction) on the grounds that not all necessities are syllogisms. Since Aristotle sometimes seems to use *sullogismos* and *sullogizesthai* to cover both valid deductions and syllogisms proper, I translate these as “deduction” and “deduce” rather than as “syllogism” and “syllogize.”

#### Note 178

**[2a] According to the arguments from the sciences, there will be Forms of all things of which there are sciences:** Aristotle’s point may be this. There is no sharp divide between crafts (*technai*) and sciences (*epistêmai*) in Plato’s dialogues, where the most common object of the verb *epistasthai* is *technê*. But if there are Forms of all things of which there are crafts, such as carpentry, there will be Forms of artifacts, such as couches and beds “which Platonists do not want” (Alex. *In Metaph.* 80.7 = Fine, 14). In the *Republic* and elsewhere Plato seems to accept that there are such Forms (990<sup>8n</sup>), but later these may have come to seem problematic.

**[2b] According to “the one over many” there will be Forms even of negations:** “[*Eleatic Stranger*] We have to say the both the not large and the large equally are.



[*Theaetetus*] Yes. [ES] So we have to put the not just on a par with the just, in that neither is any more than the other? [*Tht.*] Of course. . . . [ES] [So] we've caused the Form of what is not to appear" (*Sph.* 257e–258e). At one point, then, Plato seems to have accepted Forms of negations, but, as with Forms of artifacts, these too may later have come to seem problematic.

**Appearance** (*phantasma*): See A 1 981\*6n.

[2c] **According to the argument that there is understanding of a thing that has passed away there will be Forms of things that pass away:** Appearances of couches-that-have-passed away constitute a many. By the "one over many" argument targeted in [1] there is a corresponding Form of couches-that-have-passed-away. This seems to bloat the ontology of Forms in an unattractive way.

# Note 179

**More exact of the arguments:** The association of *akribeia* with demonstration from starting-points (M 3 1078\*10n) suggests that the arguments referred to may be those that begin from the starting-points of the theory of Forms, in implied contrast with the previous ones, which rely on further posits or presuppositions. On the other hand, the association of more exact arguments with more logico-linguistic ones (M 5 1080\*10) suggests that the arguments may have appealed especially to the things we say (Z 4 1029\*13n). Beyond identifying some of the consequences of them that were found unpalatable by "we" Platonists, however, we are left in the dark as to what these arguments are.

[3a] **Some produce Ideas of relatives, of which we say there is not an intrinsic kind:** "But they [Platonists] used to say that there are no Ideas of relatives, since in their view the Ideas subsist intrinsically, being in their view sorts of substances, whereas relatives have their being in relation to each other . . . if indeed a relative is like an offshoot" (Alex. *In Metaph.* 83.25 = Finc. 18). The worry, apparently, is that relatives depend ontologically on their relata. But as in the case of Forms of artifacts and of negations, Plato himself seems not to have been concerned about this, since he explicitly includes what seem to be relatives among the Forms—for example, he speaks of "the equal itself" (*Phd.* 74e7) and "the large itself" (*Prm.* 131c12) and included sameness and difference among his five "great kinds" (*Sph.* 254e2–3).

**Relatives** (*tôn pros ti*): See Δ 7.

[3b] **Others introduce the Third Man:** "[*Parmenides*] I suppose you think that each Form is one on the basis of the following consideration: whenever some many seems to you to be large, there presumably seems to be one Idea, the same one as you look at all of them, from which you conclude that the large is one. [*Socrates*] That's true. [P.] What about the large itself and the other large things? If you look at all of them in the same way with the soul, won't some one large again appear by which all these appear large? [S.] It seems so. [P.] So another Form of largeness will make its appearance, which has emerged beyond largeness itself and the things that participate in it, and in turn another over all of these, by which all of them will be large. Each of your Forms will no longer be one, then, but unlimited in number" (Plato, *Prm.* 132a1–b2). It seems to be to this argument, or one of

this sort, that Aristotle refers, with “man” substituted for “large,” although he nowhere recognizes that Plato was himself the source of the argument: “Again, there is the argument that there is a third man beyond man itself and particular men” (SE 22 178<sup>b</sup>36–37; also Z 13 1039<sup>a</sup>2–3). The argument is discussed in greater detail at Z 6 1031<sup>b</sup>28–1032<sup>a</sup>4, and the problem with it succinctly characterized at Z 13 1038<sup>b</sup>34–1039<sup>a</sup>3.

**Introduce** (*legousin*): Literally, “speak of” or “say.”

#### Note 180

**People who speak of Forms:** Reading οἱ λέγοντες εἶδη, which OCT brackets for deletion.

[4a] **It is not the dyad that is primary but number:** What Platonists prefer to the existence of Ideas must, it seems, be the great and the small (the indefinite dyad) and the one, which are the material and formal (or substantial) starting-points (990<sup>b</sup>22) respectively from which the Ideas or Forms are generated or composed (A 6 987<sup>b</sup>20–21). Aristotle’s objection—notice the reference to eternal twos in [6b]—is perhaps the following: The indefinite dyad is an eternal two, and so—like all other twos or threes or what have you—participates in the Form of number. Forms, however, are separate from and ontologically prior to the things that participate in them. Hence the Form of number is prior to the very thing (the indefinite dyad) which, as a starting-point of the Forms, is supposed to be prior to it.

[4b] **The relative is prior to the intrinsic:** Like [4a] this must, it seems, be aimed at the indefinite dyad and the one. If these are primary and the Forms are composed of them, the Forms depend on a certain relation holding between the indefinite dyad and the one. But the Forms are supposed to be substantial intrinsic beings, which, as such, do not depend on relations but are, rather, prior to them: “what is intrinsically—that is, the substance—is naturally prior to relation (for a relation would seem to be an offshoot or coincident of being), so that there will not be some common Form set over these” (NE I 6 1096<sup>a</sup>20–22).

#### Note 181

[5a] **By the supposition in accord with which we say that there are Ideas, there will be Ideas not only of substances but of many other things:** [5a] draws on [2a] and [2c], which are included in “the supposition in accord with which we say there are Ideas,” to show that there are Ideas or Forms of non-substances or attributes, including coincidents. But if B is a coincident of A, A will participate in the Form of B coincidentally and (in Aristotle’s terminology) B will be *in* A but not *said of* A. [5b] draws on “what is necessary and the beliefs held about the Ideas” to show that there are Forms of (Aristotelian) substances only. This uncovers a deep conflict between the defining features attributed to Forms and the arguments used to establish their existence.

**The intelligible object is a one:** That is, a one over many.

**Intelligible object:** See A 1 981<sup>a</sup>6n.

#### Note 182

[5b] **In accord with the necessities of the case and with the beliefs held about them, if the Forms are to be participated in, there must be Ideas of substances**

**only:** A fundamental belief about the Forms is that they are separate from the perceptible particulars that exist here. But if they are separate, they are (Aristotelian) substances. If a substance A participates in a Form B, however, (i) it must do so in such a way that B is not said of A. For no substance is ever said of an underlying subject. In addition, (ii) A must participate in B non-coincidentally. For if A participated in B coincidentally, B would be a coincident of A and could not tell us what A is or what A's substance or essence is, which is what Forms were introduced to do. However, if B must tell us what A's substance or essence is, it must be the Form of a (Aristotelian) substance.

**Insofar as it is not said of an underlying subject** (*mê kath' hupokeinon legetai*): "Substance—what is said to be substance most fully, primarily, and most of all—is what is neither said of an underlying subject nor in an underlying subject (for example, a particular human or a particular horse)" (*Cat.* 5 2<sup>o</sup>11–14); "By 'in an underlying subject' I mean what is in something not as a part and cannot be separate from what it is in" (1 1<sup>a</sup>24–25); "If something is said of an underlying subject both its name and its account are necessarily predicated of the underlying subject—for example, human is said of an underlying subject, a particular human, and the name at any rate is predicated (since you will be predicating human of a particular human)—and also the account of human will be predicated of a particular human (since a particular human is also a human)" (5 19–26). If the Form B were said of a particular A, then B could not be a substance, since no substance can be said of an underlying subject (if it were in A, it would not be separate from A but ontologically dependent on it).

**If something participates in double-itself:** The double-itself = the Form of the double (*Z* 16 1040<sup>b</sup>30–34).

#### Note 183

[6] **It is the same things that signify substance here as over there—or what will it mean to say that there is something beyond these things here, the one over the many:** [5b] argues that there must be Ideas or Forms of substances only. [6] uses that conclusion to draw an unattractive disjunctive conclusion. A two (call it A) that passes away (a two in the perceptible world such as Callias' two eyes) participates in two-itself (the Form of twoness). Now consider an eternal two, two-itself (call it B). Since no Form can be participated in non-coincidentally, if A and B both participate in two-itself, they must do so non-coincidentally. Moreover, it cannot be that they participate in it non-coincidentally in different ways, on the grounds that two-itself is said of B but not of A. For Forms, as substances, cannot be said of an underlying subject. Hence A and B have something in common: they both participate in two-itself in precisely the same way. Two-itself is a substance, however, and so whatever it participates in cannot itself be a substance, since it would have to be said of two-itself as of an underlying subject, and no substance is ever said of anything in that way. But B is both identical to two-itself and participates in it. So two-itself cannot be a substance. If, on the other hand, A and B have nothing in common, they are twos homonymously, and so we should not be looking for an explanation, whether appealing to Forms or to anything else, of why they are twos. That

would be like looking for an explanation of why money banks and riverbanks are both banks.

**Signify (*sêmeinein*) substance here as over there:** Aristotle uses the verb *sêmeinein* and the cognate noun *sêmeion* to express (1) a relation between a linguistic element, such as a noun or name, and the thing it signifies, means, or denotes, but also, as here, (2) a relation between two non-linguistic elements, as in, those spots are a sign of—are evidence of or an indicator of—measles. It is not always clear, therefore, whether quotation marks should or should not be supplied.

#### Note 184

**They would be homonymous:** Unlike at 990<sup>b</sup>6, where it has its ordinary meaning, *homónymos* is here employed in its technical Aristotelian sense, which is explained at A 6 987<sup>b</sup>10n.

#### Note 185

[7] **The Forms are not the cause of movement or of any change whatsoever in perceptibles:** “If the Forms are causes, why are they not always continuously generating, rather than sometimes doing so and sometimes not, given that the Forms and the (things that participate in them always are?” (GC II 9 335<sup>b</sup>18–20).

**Those that are eternal:** The heavenly bodies, for instance.

#### Note 186

[8] **The Forms are also no help at all either as regards the scientific knowledge of the other things:** The Forms, as separate from the perceptibles, cannot be the substance or essence (A 3 983<sup>a</sup>27n) of “the other things,” (namely, the ones that participate in the Forms) and so cannot help us in that way to know what they are.

[9] **Or in relation to their being, if they are not components of the things that participate in them:** See 991<sup>b</sup>1–3. Plato raises a puzzle of this sort himself (*Prm.* 131a–e, *Philb.* 15b–c).

#### Note 187

**One that first Anaxagoras stated:** See A 8 989<sup>a</sup>34–<sup>b</sup>1, where Anaxagoras’ seeds are characterized as “unmixed before the start,” and so as relevantly like separate Platonic Forms.

**Eudoxus of Cnidus:** An important mathematician, astronomer, and philosopher (c. 390–c. 340 BC) who developed the general theory of proportion for incommensurable as well as commensurable magnitudes. He was acquainted with Plato and is thought by some to have been his colleague in the Academy. Parts of his astronomical theory are discussed in A 8 1073<sup>b</sup>17–38.

**Eudoxus and certain others stated:** “Among Plato’s associates, Eudoxus and certain others thought that it is by mixture of the Ideas in the things that have their being in relation to them that each of these things is” (Alex. *In Metaph.* 97.17–18 = Dooley 1, 135).

#### Note 188

**It is easy to collect many impossibilities with a view of this sort:** “If the Ideas are mixed with the other things, [1] first, they would be bodies, since it is of bodies

that there is mixture. . . . [2] Further, they will be mixed either as a whole in each of the things in which they are mixed or as a part. But [a] if as a whole, what is one in number will be in many things, since an Idea is one in number. But [b] if as a part, what participates in a part of man-itself, not what participates in the whole man-itself, will be a man. . . . [3] And man-itself, which is an Idea, insofar as it is also an animal, would participate in animal-itself. But if that were so, the Idea would no longer be simple, but composed of many things, and some of them would be primary and others secondary. But if it is not an animal, how could it not be absurd to say that a man is not an animal? [4] Further, if they are mixed into the things whose being is in relation to them, how would they still be the paradigms they say they are? For paradigms are not in this way causes of the likeness of their copies to them, namely, by being mixed into them. [5] Further, they would pass away along with the things in which they are, when these pass away. [6] On the other hand, they would not be separate by themselves either, but would be in the things that participate in them. [7] In addition, they would no longer be immovable. And there are all the other absurdities that Aristotle showed this doctrine to involve in examining it in the second book of *On Ideas* (Alex. In *Metaph.* 97.27–98.22 = Dooley 1, 135–36).

Note 189

[10] Neither is it possible to say, in any of the familiar ways of speaking, that the other things *come from the Forms*: Since things can be like Forms without being copies of them, the categorizing of Forms as paradigms will not explain the “participation” relationship unless we are also told what it is that, looking to (*apoblepon*) the Forms, produces things as copies of them. Plato gives different answers to this question for different sorts of participants. In the case of artifacts, ordinary craftsmen seem to do the work: “[*Socrates*] Where does a carpenter look in making a shuttle? Isn’t it to that sort of thing whose nature is to weave? [*Hermogenes*] Certainly. [*S.*] Suppose the shuttle breaks while he’s making it. Will he make another looking to (*blepôn*) the broken one? Or will he look to the very Form to which he looked in making the one he broke? [*H.*] In my view he will look to the Form” (Plato, *Crat.* 389a6–b4); “[*S.*] Don’t we usually say, too, that the craftsman (*dêmiourgos*) who makes each manufactured item looks toward (*blepôn*) the Idea when he makes the couches or the tables we use, and similarly with other things? For surely no craftsman makes the Idea itself” (*Rep.* X 595b4–8). In the case of natural objects on the other hand, it is the divine craftsman who looks to the Forms to make them: “[*Timaeus*] In addition, we say that what comes to be must come to be as a result of some cause. Now to find the maker and father of the universe is hard work, and even if we did find him, to declare him to everyone is impossible. And so we must go back and where it is concerned investigate which of the two paradigms the maker used when he made it, the one that does not change and stays the same or the one that has come to be. Well, if this cosmos of ours is noble and its craftsman (*dêmiourgos*) good, clearly he looked (*eblepen*) to the eternal one” (*Ti.* 28c2–29a3). Aristotle does not refer to these passages or explain what he thinks is wrong with the views they propose.

**The other things come from (ek) the Forms:** The various ways in which something comes from something are explored in  $\Delta$  24.

Note 190

**[11] There will be more than one paradigm of the same thing and so more than one Form:** Aristotle's example suggests that his objection concerns definition. For animal and two-footed are parts of the definition of human (*Top.* I 7 103<sup>a</sup>26–27), but in what way is this to be reflected in the relationship between the Form of being two-footed, the Form of animal, and the Form of human (= man-itself)? See also Z 14.

Note 191

**[12] The Forms will be paradigms not only of the perceptibles but also of themselves—for example, the genus, as genus of several species. And so the same thing will be paradigm and copy:** The example naturally suggests that “the same thing” that will be both paradigm and copy is the genus, whereas in fact it is the several species that have this status, since relative to the genus they are copies and relative to their participants they are paradigms. (M 5 1079<sup>b</sup>34–35 has *tôn hós genos eidôn*—“the several species as species of a genus.”) Based on what is said in the dialogues it is difficult to be confident about how Plato conceived of the relationship between Forms and sub-Forms, but he does not seem to use the paradigm/copy model to characterize it.

Note 192

**[13] It would seem to be impossible for the substance and that of which it is the substance to be separate:** See [8]. On what separability is for substances, see Z 1 1028<sup>a</sup>34n.

Note 193

**[14] In the *Phaedo*, however, it is said as follows: the Forms are causes both of the being and of the coming to be of things:** “Nothing makes (*poiei*) something a beauty other than the presence—or community, or whatever the mode of means of accrual (*prosgenomenou*) may be—of that beauty [namely, intrinsic beauty itself (100b6)]” (Plato, *Phd.* 100d4–6); “You have no cause (*aitian*) of coming to be two other than participating in twoness” (101c4–5). It is probably these passages that Aristotle has in mind. It is unlikely, however, that they attribute *efficient* causal efficacy to Forms—something Aristotle has already acknowledged that Platonists do not do (A 7 988<sup>b</sup>1–4).

Note 194

**[15] If indeed the Forms are numbers, in what way will they be causes:** See A 6 987<sup>b</sup>21–22n.

Note 195

**There is at least one thing (*hen ge ti*):** Aristotle need not be—and probably is not—claiming that the thing in question must be one in number or of one sort. His point is more naturally taken to be that there must be at least (*ge*) one thing to underlie the ratios.

## Note 196

**The numbers themselves:** That is, the numbers that are supposedly identical to Callias and other such things that exist here.

## Note 197

[16] **One number may come to be from many numbers, but how can one Form come from many Forms?:** See M 6 1080<sup>a</sup>12–9 1086<sup>a</sup>21.

## Note 198

**In the myriad:** The myriad (10,000) here probably stands for the stock of units that make up the other numbers and the Forms.

## Note 199

**Whether the one lot as each other or all the lots as all the others:** M 7 1081<sup>b</sup>35–37 expresses the thought more clearly.

## Note 200

[17] **They will have to introduce some other kind of number (with which arithmetic is concerned), as well as all the things called “intermediates” by some thinkers:** See A 6 987<sup>b</sup>15–16n, N 3 1090<sup>b</sup>32–1091<sup>a</sup>5.

**Some other kind:** Reading ἕτερον τι γένος for OCT ἕτερον γένος (“another kind”).

## Note 201

**The things we find here (*tôn deuro*):** That is, the perceptible things in this world.

## Note 202

[18] **Each of the units in the two comes from some prior two, but this is impossible:** Sometimes *hê duas* (“the two”) refers to (1) the indefinite dyad (990<sup>b</sup>19), sometimes to (2) the number two (M 7 1081<sup>b</sup>19). If (1) is meant, the problem is that, like any two, the indefinite dyad consists of units, which must derive from the indefinite dyad and the one, with the result that there has to be an indefinite dyad that is prior to itself. If (2) is meant, the problem is that the units in the number two must come from the indefinite dyad, which is itself a two, making two prior to itself. See [4a], [4b], and M 8 1083<sup>b</sup>23–36.

## Note 203

[19] **Why is number, when taken all together, one?:** See M 7 1082<sup>a</sup>15–26, also Z 13 1039<sup>a</sup>13–14, H 3 1044<sup>a</sup>2–9, A 10 1075<sup>b</sup>34–37.

## Note 204

[20] **If indeed the units are different, Platonists should have spoken like those who say that the elements are four, or two, but in fact they speak as if the one were homoeomerous like fire or water:** See M 8 1084<sup>b</sup>13–32.

**Homoeomerous:** See A 3 984<sup>a</sup>14n.

## Note 205

**The numbers will not be substances:** See M 7 1081<sup>a</sup>5–17 and [15].

**Things are said to be one in various ways:** See Iota 2 1053<sup>b</sup>9–1054<sup>a</sup>19.

Note 206

[21] When we wish to refer back substances to their starting-points, we posit that lines come from the short and the long, plane from broad and narrow, and solid from deep and shallow, yet how, then, will either a surface have a line or a solid have a line and a surface?: See B 5 1001<sup>b</sup>26–1002<sup>a</sup>27, M 9 1085<sup>a</sup>9–19, N 3 1090<sup>b</sup>5–9.

Note 207

[22] As to the points, from what will their presence in lines come?: Since the indivisible lines, however short, must have endpoints, there must be points for them to have.

Note 208

Plato used even to contest this kind [= points] as being a geometrical dogma. Instead, he called it “starting-point of line,” and often posited that it consisted of indivisible lines: Plato’s rejection of points in favor of indivisible lines is otherwise unattested. GCI 2 316<sup>a</sup>11–12 mentions those who argue in a logico-linguistic (*logikós*) way (Z 4 1029<sup>b</sup>13n) that there must be indivisible magnitudes “because otherwise [the Form of] the triangle will be more than one.” The author of *LI*, gives the argument: “If there is an Idea of line, and if the first of the things is called by the same name, then, since the parts are prior to the whole, line-itself must be indivisible (*adiairetos*). And in the same way so must the [Idea of] the square, the triangle, the other [Ideas of] figures, and in general plane-itself and body-itself, since otherwise there will be things prior to each of them” (968<sup>a</sup>9–14).

Note 209

Wisdom inquires into the cause of perceptible things (*phanerôn*): See E 1 1026<sup>a</sup>17n, A 9 1074<sup>b</sup>16n.

[23] Thinking that we are stating the substance of these things—we say that they are yet other substances, but as for the way in which these are substances of those, we state it through empty words: See 990<sup>b</sup>1–8. Aristotle is both summing up in this objection and driving home that Platonists have no explanation of how the Forms function as efficient causes or—since they have no explanation of participation—as formal ones or essences ([8]–[10]).

Note 210

As we said earlier: At 991<sup>a</sup>20–22.

Note 211

We see: The “we” is we Aristotelians, as at 992<sup>a</sup>29, not we Platonists (990<sup>b</sup>9n) as it must be at 992<sup>a</sup>27.

The very thing we see to be the cause for the sciences: Aristotle assigns a privileged place in science to the formal cause or essential nature (Z 6 1031<sup>b</sup>6, 20–21), which he identifies with the final cause: “what something is and what it is for the sake of are one” (*Ph.* II 7 198<sup>a</sup>25–27). But it is probably the final cause that he has in mind here.



**Which we say is one of the starting-points:** Plato thought that the Form of the good is the unhypothetical starting-point of all so-called sciences, the grasp on which by dialectically aided understanding is needed to turn them into genuine sciences (*Rep.* VI 510b9–511d5). But since Aristotle has already represented Platonists as not having a clear enough conception of how the Form of the good functioned as a final cause (A 7 988<sup>b</sup>11–16), “we” is probably not we Platonists, but—as at 992<sup>a</sup>30—we Aristotelians.

**For the sake of something else:** “[Socrates] Moreover, I take it that if the methodical inquiry into all the subjects we have mentioned [which include all of mathematics] arrives at what they share in common with each other and what their affinities are, and draws conclusions about their kinship, it does contribute something to our goal and is not labor in vain, but that otherwise it is in vain. . . . Or don’t you know that all these subjects are merely preludes to the theme itself which must be learned? I mean, you surely do not think that people who are clever in these matters are dialecticians. . . . Then isn’t this at last, Glaucon, the theme itself that dialectical discussion sings? It itself is intelligible. But the power of sight imitates it. We said that sight tries at last to look at the animals themselves, the stars themselves, and, in the end, at the sun itself. In the same way, whenever someone tries by means of dialectical discussion, and without the aid of any sense-perceptions, to arrive through reason at the being of each thing itself, and does not give up until he grasps what good itself is with understanding itself, he reaches the end of the intelligible realm, just as the other reached the end of the visible one. . . . Well then, don’t you call this journey dialectic?” (Plato, *Rep.* VII 531c9–532a4).

#### Note 212

[25] **The underlying substance as matter we might take to be too mathematical:** Sec N 1 1088<sup>a</sup>15–21.

**The physicists:** A 5 986<sup>b</sup>14n.

#### Note 213

[26] **And as for movement, if these things constitute movement, it is clear that the Forms will move. But if not, where does movement come from?:** (1) Forms were introduced to be immovable (unchangeable) definable objects of scientific knowledge separate from perceptible particulars, which—as always moving or in Heraclitean flux—were unsuited to play this role (A 6 987<sup>a</sup>29–<sup>b</sup>10). (2) Forms were composed of the one and the indefinite dyad (the great and the small), with the one serving as the essence or formal cause and the indefinite dyad serving as matter (988<sup>a</sup>7–14). (3) Since of these, the immovable element must be the essence, the indefinite dyad (a) must be the element responsible for movement or (b) there must be no such element. (4) If (3a), the Forms as composed of the indefinite dyad, will themselves move, which contradicts (1). If (3b), Platonism has no explanation of movement and the investigation concerning nature is simply done away with.

**These things:** That is, the great and the small.

#### Note 214

[27] **What seems to be easy, namely, to show that all things are one, does not come about:** “The Platonists also attempted, by using a sort of *ekthesis* to lead

back all things to the one and the substance that properly belonged to them, and their way of using *ekthesis* was as follows. Examining particular men, they would look for the similarity in all of them, and finding this to be one and the same in all men, inasmuch as they are men, they lead all men back to this one, and said that men are men by participation in the one, and this one that is over men they called man-itself. They did the same in turn in the case of horses, dogs, and the other animals. Moreover, by *ekthesis* in turn on both men and dogs and the other animals, they again posited that these owe the fact that they are animals to a one, and this one they made the cause of their being animals, and what is more, they again made a one and an Idea and called it animal-itself, and to this one they led animals back. In similar fashion, they again took animals and plants and the other bodies, and finding that all these are substances by participation in a one, they posited an Idea and a one of substance, substance-itself, and to this one they in turn led back all substances. And in this way saying that substance and quality are in turn beings by participation in being, and making a being-itself, they led back all beings to this one. And thus, as they proceeded methodically and used *ekthesis*, they thought that they were leading back all the beings to the one, that is, to the starting-point" (Alex. *In Metaph.* 124.9–125.4 = Dooley 1, 166–167). Aristotle's objection is this: "There are many things that are predicated in the same way because of some similarity they have to each other but that do not have any one-itself over them due to the fact that their similarity is not in either genus or species. Things that are predicted negatively are of this sort" (126.5–7 = Dooley 1, 168). It concedes, for the sake of argument, that *ekthesis* may result in separate Forms in some cases, but denies that it will do so in all, so it is somewhat different from objections like [1b] that focus on separation.

# Note 215

**For by *ekthesis* it does not come about that all things are one:** The verb *ekti-thenai* (*ektiithesthai* is the passive form) means "expose," "exhibit," or "set out." In Aristotle's logic *ekthesis* is a way of confirming the truth of a third figure syllogism (P belongs to all S, R belongs to all S, P belongs to some R) by exhibiting or setting out a particular S (call it, N). For N will be R and N will be P (*APr.* I 6 28<sup>a</sup>10–30). The original home of *ekthesis*, though, is in a geometrical proof, where it refers to the stage at which an arbitrary instance is set out, assigned names, and drawn for the student to see ("Let ABC be a triangle in which the side AB = the side AC"). Aristotle employs the term in this sense at *APr.* I 41 49<sup>b</sup>33–50<sup>a</sup>4: "We must not think that something strange results from the setting out (*to ektiithesthai*). For we make no use of the existence of the this something (*to tode ti*), but rather do just as the geometer does when he says that this line here (*tênde*) is a foot long, straight, and without breadth, when it is not, but does not use these things as something from which to deduce. . . . We use setting out just as we use perception, speaking to the student (*pros ton manthanonta legontes*); for we do not use it on the supposition that it is not possible to give a demonstration without these things, as it would be with the premises of a deductive argument." Here, however, the term almost certainly refers to the Platonic method, embodied in the "one over many" argument,

of exhibiting or setting out a single Form for each many (N 3 1090<sup>a</sup>16–20, Z 6 1031<sup>b</sup>18–22, M 9 1086<sup>b</sup>7–10).

**If we do not grant that the universal is a genus, which in some cases is impossible:** For example, being and the one are universals, but they are not genera (B 3 998<sup>b</sup>22, H 6 1045<sup>b</sup>6).

#### Note 216

[28] **There is no account of the lengths, surfaces, and volumes that come after the numbers, either of the way they are or will be or of what capacity they have:** The lengths, surfaces, and volumes that “come after the numbers” have a status like that of the Forms, since they are ones over manys. But they are not Forms, since the Forms are numbers they are not, and they are not the corresponding intermediate objects of mathematics either, since there are, for example, many mathematic triangles of the same sort, but only one such triangle that is a one over many. Hence they must be a new fourth sort of thing, but their ontological status is unclear as is their potentiality (*dunamis*) or causal explanatory role, since it is Forms that are supposed to explain perceptibles (A 6 987<sup>b</sup>18–19).

**Capacity (*dunamin*):** The term *dunamis* (plural: *dunameis*) is used by Aristotle to capture two different but related things. (1) As in ordinary Greek, it signifies a power or capacity something has, especially to cause movement in something else (productive *dunamis*) or to be caused to move by something else (passive *dunamis*). (2) It signifies a way of being, namely, potential (*dunamei*) being as opposed to actual (*entelecheia*[i]) or active (*energeia*[i]) being. Context usually makes clear which is intended. See also Δ 12.

#### Note 217

**Said [to be] in many ways:** See Γ 2 1003<sup>a</sup>3–<sup>b</sup>10, Δ 7 1017<sup>a</sup>7–<sup>b</sup>9, E 2 1026<sup>a</sup>33–<sup>b</sup>4, Z 1 1028<sup>a</sup>10–31, © 10 1051<sup>a</sup>34–<sup>b</sup>6.

**In this way:** Presumably, by *ekthesis*.

**Doing or undergoing or straightness** (*to poiein ē paschein ē to euthu*): “Things have some fixed substance of their own. . . . They are [what they are] intrinsically and in relation to their own substance, which is theirs by nature. . . . And if things are of such a nature, aren’t actions performed in relation to them the same way? Or don’t actions constitute some one kind (*eidos*) of beings?” (Plato, *Crat.* 386e1–8).

#### Note 218

**Incorrect** (*ouk alēthes*): Literally, “not true.”

#### Note 219

**All learning takes place through things of which there is prior knowledge:** “All teaching and all learning involving thought result from already existing knowledge. This is evident if we look at all the cases, since the mathematical sciences arise in this way and so do each of the crafts as well. The same holds too where arguments are concerned, whether those that proceed by deduction or those that proceed by induction, since it is from things previously known that they both do

their teaching—the former getting hold of them as if from discerning people, the latter showing the universal through the particular's [already] being clear" (*APo.* I 1 71<sup>a</sup>1–8).

**We must have prior knowledge of the things from which the definition comes and they must be well-known:** "If we are to have scientific knowledge through demonstration, . . . we must know the starting-points [= definitions of essences] better and be better convinced of them than of what is being shown, but we must also not find anything more convincing or better known among things opposed to the starting-points, from which a contrary mistaken conclusion may be deduced, since someone who has unconditional scientific knowledge must be incapable of being convinced out of it" (*APo.* I 2 72<sup>a</sup>37–<sup>b</sup>4; also *Top.* V 5 134<sup>a</sup>34–35, *NE* VI 3 1139<sup>b</sup>33–35).

**Either through demonstrations or definitions:** See A 1 981<sup>a</sup>3n.

**Induction** (*epagôgê*): See Introduction pp. xlii–l.

#### Note 220

**If such knowledge were in fact innate:** "[Meno] And how are you going to inquire into virtue, Socrates, when you do not at all know what it is? For what sort of thing, from among the ones you do not know, will you take as the object of your inquiry? And even if you do happen to bump right into it, how are you going to know that it is the thing you did not know? . . . [Socrates] Seeing that the soul is immortal, then, and has been born many times, and has seen both the things here and the ones in Hades—in fact, all things—there is nothing it has not learned. So it is in no way surprising that it can recollect about virtue and other things, since it knew them before. For, since all nature is akin, and the soul has learned all things, nothing prevents someone who has recollected one thing—which men call learning it—from discovering all the rest for himself, provided he is courageous and doesn't get tired of inquiry. For the whole of inquiry or learning, in that case, is recollection" (Plato, *Men.* 80d5–81d5).

**The most excellent of the sciences:** Theoretical wisdom (A 1 982<sup>a</sup>1–3, 2 983<sup>a</sup>11).

#### Note 221

[31] **How could we come to know the things from which the most excellent science comes, and how is this to be made clear?:** This targets our knowledge of [30a] the elements of the definitions that are the starting-points of theoretical wisdom. It asks, what do we do if a puzzle-generating dispute arises about these?

#### Note 222

**Some people say [1] that ZA comes from S, D, and A, whereas others say [2] that it is another sound, and not any of the well-known ones:** The Greek letter *zeta* has two pronunciations, or is associated with two voiced sounds. Those in [1] claim that ZA is pronounced like S/DA; those in [2] claim it is a unique voiced sound, a phonetic element. See also *Iota* 1 1053<sup>a</sup>16–17n.

#### Note 223

[32] **As to the things of which there is perception, how could someone come to know them without having the relevant perception?:** This concerns our

knowledge of [30b], since induction begins with perception of particulars (992<sup>b</sup>33n).

#### Note 224

**Empedocles says . . .** : DK B96 = TEGP 114 F69, DK B98 = TEGP 115 F70.

#### Note 225

**In a perspicuous way** (*saphôs*): See A 4 985<sup>a</sup>13n.

#### Note 226

**About these things we have also made our views clear earlier. But let us go back again** (*epanelthômen palin*) **to whatever we might puzzle over concerning these very things. For maybe from these we might achieve something of a puzzle-free condition in connection with the later puzzles:** “These things” and “these very things” must, it seems, have the same reference, which could be (1) the four causes, (2) the views of previous thinkers about them, or (3) the vague and imperspicuous ways in which “the first philosophy concerning all things” expressed itself. If the reference is to (1) “earlier” refers to the discussion of the four causes in the *Physics*, which is summarized in A 3 983<sup>a</sup>24–<sup>b</sup>3. If it is to (2) or (3) “earlier” refers to the discussion of previous thinkers in A 3–9, although the focus of (2) is on the views of these thinkers and that of (3) is on the vagueness and unclarity of those views, both of which feature prominently in these chapters. (2) can be ruled out, it seems, since neither  $\alpha$  nor B returns to the views of previous thinkers about the four causes.

The things that might puzzle us about (1) the four causes that we are to go back again to could be (1a) the topics of the fourteen puzzles listed in B 1, the opening of which refers to a set of puzzles to be raised first (*aporêsai . . . proton*) in implied contrast, perhaps, with a later set, and whose wording (*anagkê . . . epelthein*) somewhat echoes that used here. However, not all the puzzles listed in B 1 deal with the four causes—in fact only P1 and P8 so much as mention causes. Moreover, no puzzles later than these fourteen seem to figure in Aristotle’s discussion.

A different possibility is that the reference is to (1b) the topics discussed in Little A (=  $\alpha$ ). The problem here is that while  $\alpha$  2 does discuss the four causes, the focus of the book as a whole seems rather to be on the nature of the wisdom that, because it concerns all things, is concerned with causes and starting-points.  $\alpha$  1, indeed, seems to be most naturally related not to (1) or (2) but to (3). The very things we are to go back to, on this reading, are those features of wisdom that might give rise to puzzles stemming from the way earlier philosophers wrote about it (headnote to  $\alpha$ ), while the later puzzles are those listed in B 1, which are also more concerned with the nature of wisdom, as a science of starting-points and causes, than with the four causes themselves. On balance, then, (3) seems preferable to either (1) or (2).

## BOOK LITTLE ALPHA (II)

#### Note 227

**Little Alpha =  $\alpha$ :** The odd title of this book has been taken to indicate the difficulty that the original editors of the *Metaphysics* had in understanding its place in the overall scheme of things. Nonetheless, they chose an intelligible one.

$\alpha$  1 first looks back to A 3–10, explaining why previous thinkers could be successful in latching on to causes without being able to articulate them in a perspicuous way and acknowledging the importance of these thinkers as preservers of a tradition of investigation and a source of, at any rate, partial truths.

A 1 and 2 introduce us to the science that investigates the beings and philosophizes about the truth concerning their starting-points and causes (A 3 983<sup>b</sup>2–3), which they identify with the science that is doubly divine, in that the [primary] god possesses it and it deals with him (A 2 982<sup>b</sup>28–983<sup>a</sup>11).  $\alpha$  1 also looks back to these chapters, reminding us that philosophy is theoretical scientific knowledge of the truth, and so of its causes, that what is most true is what causes all derivative things to be true, so that the starting-points of the eternal beings must be the most true ones.  $\alpha$  2 then argues that of each of the four causes there must be a first, which—as  $\alpha$  1 has argued—must be eternal (994<sup>b</sup>7–9).

With all this on the table,  $\alpha$  3 turns to the question of the *way* we gain knowledge of causes, pointing out that we need to be well educated ahead of time so that we will not have mistaken or unrealistic expectations about the route this way should take. Platonists, for example, think that the route in question should manifest the argumentative exactness found in mathematics, since they think that all beings can be analyzed in terms of numbers, but in fact such exactness is appropriate only in sciences dealing with things that involve no matter (995<sup>a</sup>14–16).

The physicists, by contrast, think that the route is that of natural science. But since the natures of the beings studied by natural science presumably all involve matter, it seems that the way to theoretical wisdom, as a science purporting to deal with *all* beings, cannot be as they suppose, since some beings (for example, those studied by mathematics) seem to involve no matter. A puzzle thus arises concerning the unity of theoretical wisdom (995<sup>a</sup>19–20, B 1 995<sup>b</sup>4–6), which an investigation of natures might help resolve.

## Note 228

**The fact that we can have some grasp on the whole while being incapable of grasping the part:** “In all methodical inquiries in which there is knowledge, that is, scientific knowledge, of things that have starting-points, causes, or elements, it comes from knowledge of these (for we think that we know each thing when we know its primary causes and primary starting-points, all the way to its elements), so it is clear that in the scientific knowledge of nature our first task must be to try to determine the starting-points. And the natural route is from things that are knowable and more perspicuous to us toward things that are more perspicuous and more knowable by nature, since the same things are not knowable to us as are knowable unconditionally. That is precisely why we must in this way advance from things that are less perspicuous by nature but more perspicuous to us to the things that are more perspicuous by nature and more knowable. And the things that are in the first instance clear and perspicuous to us are rather confused. It is only later, through an analysis of these, that we come to know their elements and starting-points. That is why we must proceed from the universal to the particular. For it is the whole that is more knowable by perception, and the universal is a sort of

whole. For the universal embraces many things as parts. The same thing happens in a way with names in relation to their account. For a name like 'circle' signifies a sort of whole in an undivided way, whereas the definition [= account] divides it into its particular [elements]" (*Ph.* I 1 184<sup>a</sup>10–<sup>b</sup>3). See also Z 3 1029<sup>b</sup>3–12.

# Note 229

**As the eyes of bats are to the light of day so is the understanding (*ho nous*) in our souls to the things that are by nature most evident of all:** Aristotle has mentioned *nous* as a cosmic force in connection with previous thinkers (A 3 984<sup>b</sup>15, 4 985<sup>a</sup>18–21, 7 988<sup>a</sup>34, <sup>b</sup>8), and has used the cognate verb (*noein*) in passing to express a view of his own (A 9 991<sup>b</sup>27), but this is his first use of *ho nous* in the *Metaphysics* to refer explicitly to a part of the soul that he himself recognizes.

In the broadest sense of the term, someone with *nous* is someone with sound common sense and the cognate verb *noein*, like *dianoesthai*, means "to think" (*Met.* I 3 340<sup>b</sup>14, *Ph.* IV 1 208<sup>b</sup>25, *NE* III 1 1110<sup>a</sup>11). *Nous*, in this sense, is what enables a soul to suppose, believe, deduce, calculate, reason, and believe, so that it is possible to *noein* something false (*DA* III 3 427<sup>b</sup>9). In the narrow sense, which is the one relevant here, *nous* is what makes possible a type of knowledge of universal scientific starting-points that, unlike scientific knowledge proper, is not demonstrable from anything further: "About the starting-point of what is scientifically known there cannot be scientific knowledge . . . since what is scientifically known is demonstrable . . . the remaining alternative is for *nous* to be of starting-points" (*NE* VI 6 1140<sup>b</sup>33–1141<sup>a</sup>8); "*nous* is of the terms or definitions (*horoi*) for which there is no reason (*logos*)" (8 1142<sup>a</sup>25–26).

This *nous* is a divine substance (*NE* I 6 1096<sup>a</sup>24–25, X 7 1177<sup>b</sup>19–1178<sup>a</sup>8), or anyway the most divine one in human beings (X 7 1177<sup>a</sup>16), and so it shares in the immortality that is characteristic of gods: "it alone [of the parts of the human soul] is immortal and eternal" (*DA* III 5 430<sup>a</sup>23). Consequently, it alone of these parts is separable from the human body and can survive its death: "*Ho nous* seems to be born in us as a sort of substance, and not to pass away . . . understanding (*noein*) and contemplating (*theôrein*) are extinguished because something else within passes away, but it itself is unaffected" (I 4 408<sup>b</sup>18–25; also *Long.* 2 465<sup>a</sup>26–32). Among sublunary animals this *nous* is fully possessed only by human beings (*PA* II 10 656<sup>a</sup>7–8, *NE* X 8 1178<sup>a</sup>24–25). In fact, a human being is most of all his *nous* (IX 8 1168<sup>b</sup>31–32, X 7 1178<sup>a</sup>2–8).

Although classified in these texts as a substance, *nous* is also sometimes classified as a state (*hexis*) of the soul that "grasps the truth by way of assertion and denial" (*NE* VI 3 1139<sup>b</sup>15–17). For in its case the distinction between a state and its activation collapses, since it is "in substance [or essence] and activity" (*DA* III 5 430<sup>a</sup>18), though it must be in touch with an intelligible object in order to grasp the truth about it. See A 7 1072<sup>b</sup>18–30, notice *eu echei* at 1072<sup>b</sup>24. On the metaphor of touching, see Θ 10 1051<sup>b</sup>24n.

No English term is a precise equivalent for *nous* or *noein* in this narrow sense. "Intellect," which is in many ways the best choice, lacks a cognate verb in current

use. “Understanding” is better in this respect but shares with “intellect,” “intelligence,” “intuitive reason,” “apprehension,” and other common translations the defect of not being factive or truth entailing, since *nous* is one of the five states of the soul “in which the soul grasps the truth by way of affirmation and denial” (VI 3 1139<sup>b</sup>15–17).

**Our souls:** See A 18 1022<sup>a</sup>32.

**The things that are by nature most evident of all:** Namely, the primary starting-points and causes that philosophy seeks.

### Note 230

**Timotheus:** A famous lyre player and lyric poet from Miletus (c. 450–360 BC), who lived and worked in Athens. In 420 BC he defeated Phrynis in a lyre competition.

**Phrynis:** A lyre-player and lyric poet from Mytilene. He is mentioned as still alive in Aristophanes, *Clouds*, 971, which was first produced in 423 BC. Though he won first prize for lyre at a Panathanean festival, his lyric poetry was evidently of lesser quality.

### Note 231

**Of practical science it is function:** “The present work [= *NE*] is not undertaken for the sake of a theoretical science, as our others are (for we are not engaging in the investigation in order to know what virtue is but in order to become good people, since otherwise there would be nothing of benefit in it), we must investigate what relates to actions, that is, in what way they are to be done” (*NE* II 2 1103<sup>b</sup>26–30).

**Function (*ergon*):** In the sense of a for-the-sake-of-which, or end (B 2 996<sup>b</sup>7n).

**Whenever practical people investigate the how of things, what they get a theoretical grasp on is the cause not intrinsically but in relation to something (*pros ti*):** “What is unrelated to action too, namely, the true and the false, is in the same genus as the good and the bad, but they differ in that the first is unconditional, the second relative to something [or someone] (*tini*)” (*DA* III 7 431<sup>b</sup>10–12).

**And now:** The canonical practical question being, what would be good *for me* to do now?

### Note 232

**Synonymous attribute:** See A 6 987<sup>b</sup>10n.

### Note 233

**As each thing is as regards being, so it is too as regards truth:** An expression of Aristotle’s realism about truth: it is how a being is that determines the truth about it (Γ 7 1011<sup>b</sup>26–28, Θ 10 1051<sup>b</sup>6–9).

### Note 234

**For of medial (*mesôn*) things . . . down to now:** The thing existing now is the one whose causes we are investigating, so that we are led from it “upward” (or backward) through the series of causes looking for the first one. The argument aims to show that there must be first causes of all four sorts.



## Note 235

**It is not what comes to be *something* that comes to be as a result of coming to be but what exists after the coming to be [is complete]:** In other words, coming to be is not a matter of coming to be something but of coming into being, or coming into existence.

## Note 236

**The other sort, however, are reversible:** See A 8 989<sup>a</sup>16n.

## Note 237

**At the same time . . . :** Aristotle has established that there must be some causal starting-point, since causes cannot be unlimited [1] in series, either upward (994<sup>a</sup>11–19) or downward (994<sup>a</sup>19–<sup>b</sup>6). Now he reminds us of what he has concluded at α 1 993<sup>b</sup>28–31, namely, that the primary starting-points, as starting-points of the eternal beings, must themselves be eternal.

**The first thing from (*ek*) whose passing away something came to be must be non-eternal:** The use of *ek* suggests that the cause under discussion is or includes the material cause. The primary material causes are the elements, earth, water, air, and fire, each of which comes to be from—*ek* in sense [b]—the passing away of one of the others. See Z 3 1029<sup>a</sup>20–21n(2).

## Note 238

**Someone who has understanding, at any rate, always does the actions he does for the sake of something, and this is a limit, since the end is a limit:** “If, then, there is some end of things doable in action that we wish for because of itself, and the others because of it, and we do not choose everything because of something else (since if *that* is the case, it will go on without limit so that the desire will be empty and pointless), it is clear that this will be the good—that is, the best good” (NE I 1094<sup>a</sup>18–22).

## Note 239

**Neither can the essence be referred back to another definition that is fuller in account, since it is always the one that comes before that is more a definition, and not the one that comes after, and if the first one is not a definition, neither is the next:** Suppose E is the essence of something, and that D<sub>1</sub> is its definition. The claim is that D<sub>1</sub> can be referred back to D<sub>2</sub>, D<sub>2</sub> to D<sub>3</sub>, and so on without limit, so that we never come to elements or terms that cannot be referred back to something that is fuller or more detailed. Aristotle’s counterclaim is (1) that if D<sub>1</sub> properly defines E, and so defines it with the proper level of detail, D<sub>2</sub> must be a less good definition of it, whereas (2) if D<sub>1</sub> does not properly define E, D<sub>2</sub> and the rest cannot do so either, since all they do is analyze or unpack D<sub>1</sub>. See also H 3 1044<sup>a</sup>1–2.

## Note 240

**It is impossible to have knowledge until we come to indivisibles (*atoma*):** “Just as it is possible for A to belong to B indivisibly, so it is also possible for it not to belong indivisibly. By belonging or not belonging indivisibly I mean that there is

no middle term for them, since they no longer belong or do not belong in virtue of something else" (*APo.* I 15 79<sup>a</sup>33–36); "By a demonstration I mean a scientific deduction, and by scientific I mean a deduction in virtue of which we have scientific knowledge of something. . . . Demonstrative scientific knowledge must proceed from items that are, true, primitive, immediate [= indivisible], and more knowable than, prior to, and causes of, the conclusion" (I 2 71<sup>b</sup>17–23).

## Note 241

**We cannot understand without making a stop:** "Understanding is more like a sort of rest or a sort of coming to a stop than a movement" (*DA* I 3 407<sup>a</sup>32–33). See also *K* 11 1067<sup>b</sup>10–11 and *A* 9 1075<sup>a</sup>7–9n.

## Note 242

**The whole line must be understood by something that does not move:** Reading ἀλλὰ καὶ τὴν ὅλην οὐ κινουμένῳ νοεῖν ἀνάγκη with Ross for OCT ἀλλὰ καὶ τὴν ὅλην ἐν κινουμένῳ νοεῖν ἀνάγκη ("but even matter must be understood in something that moves"). See *A* 9 1075<sup>a</sup>5–10.

## Note 243

**There can be nothing that is unlimited:** "It is evident from the previous considerations that there is no actually unlimited body. But if there is nothing that is unconditionally unlimited, it is clear that many impossible things result. For there will be a start and an end of time, magnitudes will not be divisible into magnitudes, and number will not be unlimited. But when alternatives have been distinguished in this way and it seems that neither is possible, there is need of an arbitrator, and it is clear that in one way there is [something unlimited] and in a way there is not. Things, then, are said to be either potentially or actually, and what is unlimited is so either by addition or by division. It has been stated that a magnitude is not actually unlimited, but by division it is unlimited. (For it is not difficult to refute indivisible lines.) So it remains for what is unlimited to be so potentially" (*Ph.* III 5–6 206<sup>a</sup>7–18).

## Note 244

**Unlimited by addition** (*to apeiron kata tēn prothesin*): As opposed to what is unlimited by division (*to apeiron kata tēn diairesin*), as in the case of the line.

## Note 245

**Unfree or ungenerous** (*aneleutheron*): *Eleutheria* is political freedom (*NE* V 3 1131<sup>a</sup>28). *Eleutheriotēs* is freedom in the use of wealth, or generosity. *Aneleutheria*, which is acquisitiveness, or being unfree in the use of wealth, has something of this sense here but also something of the broader sense—cognate with *eleutheria*—of something unsuitable for a free person: "There is a difference between the functions of the free and those of the unfree, and they [children who are to become free citizens] should share only in such things as do not make those who share in them vulgar. (Any function should be considered vulgar, and so too any craft or branch of learning, if it renders the body, the soul, or the thought of free people useless for the uses and actions of virtue.) That is why we call vulgar both the sorts of crafts that

put the body into worse condition and the sorts of work that are done for wages. For they make thought unleisured and low. Even in the case of some of the free sciences, while it is not unfree to share in them up to a point, to overly apply oneself to them with a view to exactness is liable to result in the harms just mentioned. But what one does an action for the sake of, or learns for the sake of, also makes a big difference. For what one does for one's own sake, for the sake of friends, or because of virtue is not unfree, but someone who does the same thing because of others would often seem to be acting like a hired laborer or a slave" (*Pol.* VIII 2 1337<sup>b</sup>5–21). "Liberty," "liberality," "illiberality," and "liberal" (as in a "liberal education") preserve these relationships but are not all current in everyday English. *Mikrologia* ("nitpicking") is one form of *aneleutheria* at *MM* I 4 1192<sup>a</sup>10, and *akribologia* ("exact accounting") is niggardly (*mikroprepēs*) at *NE* IV 2 1122<sup>b</sup>8.

#### Note 246

**We should already have been well educated** (*pepaideusthai*): "Regarding every sort of theoretical knowledge and every methodical inquiry, the more humble and more estimable alike, there appear to be two ways for the state to be, one that may be well described as scientific knowledge of the subject matter, the other a certain sort of educatedness. For it is characteristic of a person well educated (*pepaideumenos*) in that way to be able accurately to discern what is well said and what is not. We think of someone who is well educated about the whole of things as a person of that sort, and we think that being well educated consists in having the capacity to do that sort of discerning. But in one case, we consider a single individual to have the capacity to discern in (one might almost say) all subjects, in the other case, we consider him to have the capacity to discern in a subject of a delimited nature—for there might be a person with the same capacity as the person we have been discussing but about a part of the whole. So it is clear in the case of inquiry into nature too that there should be certain defining marks by reference to which we can appraise the way of its demonstrations, separately from the question of what the truth is, whether thus or otherwise" (*PA* I 1 639<sup>a</sup>1–15); "Not being well educated is just the inability to discern in each subject which arguments belong to it and which are foreign to it" (*EE* I 6 1217<sup>a</sup>7–10). The specific sort of educatedness referred to here is in analytics (*Γ* 3 1005<sup>b</sup>2–5).

**It is absurd to look for scientific knowledge and for the way [of inquiry] characteristic of scientific knowledge** (*tropon epistēmēs*) **at the same time**: The *tropos* of a science is its *tropos tēs zētēseōs* or way of inquiry (*APo.* I 31 46<sup>a</sup>32<sup>b</sup>36), which is correlated with the *tropos* in which it should be accepted (*Γ* 3 1005<sup>b</sup>2–5) and with the *hōs* (also "way") of the accounts or definitions of the essences that are its starting-points (*E* 1 1025<sup>b</sup>28–30), specifically, with the way matter of different sorts is or is not involved in them. Compare *K* 1 1061<sup>b</sup>27–33.

#### Note 247

**We should not demand the argumentative exactness of mathematics in all cases but only in the case of things that include no matter**: See *M* 3 1078<sup>a</sup>9–31.

Note 248

**Every nature includes matter:** See E 1 1025<sup>b</sup>30–1026<sup>a</sup>6.

Note 249

**Whether it belongs to one science or to more than one to get a theoretical grasp on causes and starting-points:** Reading καὶ εἰ μὴς ἐπιστήμης ἢ πλεόνων τὰ αἷτια καὶ τὰς ἀρχὰς θεωρεῖσθαι ἐστίν, which OCT brackets for deletion as a clause wrongly inserted from B 1 995<sup>b</sup>5–6.

**Accordingly . . . starting-points:** See E 1 1025<sup>b</sup>18–1026<sup>a</sup>32.

## BOOK BETA (III)

Note 250

**First go over topics about which we should first raise puzzles:** See A 10 993<sup>a</sup>27n. **Raise puzzles** (*aporèsai*): “There is a puzzle about whether a thing holds or not, because there are strong arguments on both sides” (*Top.* I 11 104<sup>b</sup>13–14; also *NE* IX 8 1168<sup>b</sup>10–12)—even if, as the next sentence makes clear, these arguments have been overlooked by other people.

Note 251

**Thought** (*dianoia*): *Dianoia* is often contrasted with the body (*Pol.* II 9 1270<sup>b</sup>40, VII 16 1335<sup>b</sup>16), making “mind” seem a natural translation of it. But unlike the mind, which includes perception, imagination, belief, knowledge, desire, virtues of character, and other such things, *dianoia* is contrasted with each of these. It is not perception, because all animals have that, whereas “the majority of animals do not have *dianoia*” (*DA* 15 410<sup>b</sup>24). It is not imagination, because, as we might put it, *dianoia* is propositional, or operates on things that can be true or false, asserted or denied (*Pol.* II 11 1273<sup>a</sup>22), whereas imagination is a representational state that is more like perception, more “imagistic.” Thus “what assertion and denial are in the case of thought, that, in the case of desire, is precisely what pursuit and avoidance are” (*NE* VI 2 1139<sup>a</sup>21–22). Unlike belief and knowledge, however, “thought is in fact not yet assertion” (VI 9 1142<sup>b</sup>12–13), making it natural to think of it, or some of it anyway, as the process of reasoning that can culminate in a belief or an asserted proposition (*Pol.* IV 15 1299<sup>a</sup>30 and V 8 1307<sup>b</sup>35 are nice examples). And this is further evidenced by the fact that the virtues of thought, which are theoretical wisdom and practical wisdom (*NE* I 13 1103<sup>a</sup>4–6), are (respectively) those of the scientific sub-part and the rationally calculative sub-part, of the part of the soul that has reason (VI 1 1139<sup>a</sup>5–12). At the same time, the fact that scientific knowledge includes both demonstrative reasoning and a grasp on scientific starting-points by the understanding implies that not all thinking need be in any sense inferential, since understanding is non-inferential—a grasping of something rather than something process-like (*Pol.* VII 13 1325<sup>b</sup>20 is a good example). *Dianoia* is not desire, because, while desire can cause animal movement without thought, as it does in the case of non-rational animals, “thought by itself . . . moves nothing” (*NE* VI 2 1139<sup>a</sup>35–36). As a result, it is not character (*Pol.* VIII 2 1337<sup>a</sup>38–39), since the latter, as involving desire, is cultivated by habituation,

whereas *dianoia* is cultivated by teaching (NE II 1 1103<sup>a</sup>14–18)—hence the common contrast between thought and character (Pol. III 11 1281<sup>b</sup>7).

#### Note 252

**Does not even know whether he has found what he was inquiring into:** Reading οὐδ' εἰ ποτε with Ross for ΟΥΔ' οὐδὲ ποτέρον (“nor does he know whether”). See Plato, *Men.* 80d5–81d5 (quoted A 9 993<sup>a</sup>1n).

#### Note 253

**P1:** See B 2 996<sup>a</sup>18–<sup>b</sup>26. Restated as P<sub>1</sub> at K 1 1059<sup>a</sup>20–23. Discussed at Γ 1, 2.

**The topic we went through the puzzles about (*diēporēsamen*) in our prefatory remarks:** Though the reference could be to A 2 982<sup>b</sup>7–10, this is unlikely for the following reason. The verb *diaporein*, which can mean something quite general, like “discuss,” has its technical meaning, “go through the puzzles” at 995<sup>a</sup>35, and so is very unlikely not to have it here too. At 982<sup>b</sup>7–10, however, no puzzles are gone through about the topic of P1. Hence a more likely reference is α 3 995<sup>a</sup>8–20. See headnote to α.

#### Note 254

**P2:** See B 2 996<sup>b</sup>26–997<sup>a</sup>15. Restated as P<sub>2</sub> at K 1 1059<sup>a</sup>23–26. Discussed Γ 3.

#### Note 255

**P3:** See B 2 997<sup>a</sup>15–25. Restated as P<sub>3</sub> at K 1 1059<sup>a</sup>26–29. Discussed Γ 2 1004<sup>a</sup>2–9, E 1.

#### Note 256

**P4:** See B 2 997<sup>a</sup>34–998<sup>a</sup>19. Restated as P<sub>5a</sub>, P<sub>6</sub> at K 1 1059<sup>a</sup>38–<sup>b</sup>14. Discussed A 6–10, M 1–9, N.

**Those who produce both Forms and objects of mathematics:** See B 6 987<sup>b</sup>14–18.

#### Note 257

**Intrinsic coincidents (*kath' hauta sumbebēkota*):** Often called *per se* accidents, the *kath' hauta sumbebēkota* are attributes that belong to a subject intrinsically and thus demonstrably, but are not part of its *ousia*, or essence (A 30 1025<sup>a</sup>30–32, M 3 1078<sup>a</sup>5–9, *APo.* I 7 775<sup>b</sup>1, 22 83<sup>b</sup>19). They are contrasted with non-intrinsic coincidents which belong to a subject contingently, and so non-demonstrably.

#### Note 258

**All the other such things that dialecticians try to investigate, making their investigation on the basis of reputable beliefs only:** See Γ 2 1004<sup>b</sup>17–22n.

#### Note 259

**P5:** See B 2 997<sup>a</sup>25–34. Restated as P<sub>4</sub> at K 1 1059<sup>a</sup>29–34. Discussed Γ 2 1003<sup>b</sup>22–1005<sup>a</sup>18.

#### Note 260

**P6:** See B 3 998<sup>a</sup>20–<sup>b</sup>14. Restated as P<sub>6</sub> at K 1 1059<sup>b</sup>21–1060<sup>a</sup>1. Discussed Z 10, 13.

#### Note 261

**P7:** See B 3 998<sup>b</sup>14–999<sup>a</sup>23. Restated as P<sub>6</sub> at K 1 1059<sup>b</sup>21–1060<sup>a</sup>1. Discussed Z 12 1038<sup>a</sup>19–35, 13.

Note 262

P8: See B 4 998<sup>a</sup>24–<sup>b</sup>24. Restated as P<sub>9</sub> at K 1 1060<sup>a</sup>3–27, <sup>b</sup>23–28. Discussed Z 8, 13–14, A 6–10, M 10.

Note 263

P9: See B 4 999<sup>b</sup>24–1000<sup>a</sup>4. Restated as P<sub>16</sub> at K 1 1060<sup>b</sup>28–30. Discussed A 4–5, M 10.

**Those in the accounts and those in the underlying subject:** See B 3 998<sup>b</sup>12–14.

Note 264

P10: See B 4 1000<sup>a</sup>5–1001<sup>a</sup>3. Restated as P<sub>11</sub> at K 1 1060<sup>a</sup>27–36. Discussed Z 7–10.

Note 265

P11: See B 4 1001<sup>a</sup>4–<sup>b</sup>25. Restated as P<sub>12</sub> at K 1 1060<sup>a</sup>36–<sup>b</sup>19. Discussed Z 16 1040<sup>b</sup>16–24, Iota 2.

**The one and being are not another thing** (*ouch heteron ti estin*), **but rather the substance of the beings:** See A 6 987<sup>b</sup>23n.

Note 266

P12: See B 6 1003<sup>a</sup>5–17. Restated as P<sub>19</sub> at K 1 1060<sup>b</sup>19–23. Discussed Z 13, 15, M 10.

Note 267

P13: See B 6 1002<sup>b</sup>32–1003<sup>a</sup>5. Not in K. Discussed @ 8, A 6–7.

**Potentially or actively** (*du namei ê energeia[i]*): *Energeia[i]* (“actively” or “in activity”) is often no different in meaning from *entelecheia[i]* (“actually” or “in actuality”). For discussion, see H 2 1042<sup>b</sup>10n.

**Whether they are [causes] in any other way than as regards movement:** Aristotle’s (primary) god is an entirely immovable being who is nonetheless a cause of movement and an activity (A 7 1072<sup>a</sup>21–<sup>b</sup>1, 9 1074<sup>b</sup>15–35).

Note 268

P14: B 5 1001<sup>b</sup>26–1002<sup>b</sup>11. Restated as P<sub>13</sub> at K 1 1060<sup>b</sup>12–19. Discussed M 1–3, 6–9, N 1–3, 5–6.

Note 269

**How could it belong to one science to know the starting-points if these are not contraries?:** Since scientific starting-points must figure in demonstrations, the “extremes and the middle terms must come from the same genus” (*APo.* I 7 75<sup>b</sup>10–11). As a result, a single science must deal with a single genus (I 28 87<sup>a</sup>38–39). The kinds or genera of causes—material, efficient, formal, and final—are distinct, so *prima facie* there is no single science of them. However, there could still be a single science of them if they were contraries, since contraries are in the same genus (*Cat.* 11 14<sup>a</sup>19–20). But the causes are not—or are not always or usually—contraries, but instead typically work together (*Ph.* II 7 198<sup>a</sup>25–27, 9 200<sup>a</sup>10–15), so again it looks as if there cannot be a single science of them.

Note 270

**For immovable things:** Omitting *év* added in OCT.

## Note 271

**All actions involve movement:** A claim that Aristotle himself rejects or accepts only with reservations (⊙ 6 1048<sup>b</sup>18–35, A 7 1072<sup>a</sup>24–27, 1072<sup>b</sup>1–4, NE VII 14 1154<sup>b</sup>26–27).

## Note 272

**Sophists:** The sophists were paid independent itinerant teachers of rhetoric and a variety of other subjects, who were central to intellectual life in Athens in the late 5th cent BC and later. Aristotle defines a sophist as “one who makes money from an apparent but non-genuine wisdom” (SE I 165<sup>a</sup>22–23).

**Aristippus:** An associate of Socrates (*Rh.* II 23 1398<sup>b</sup>30–32), noted for his luxurious lifestyle, and thought to be the first “Socratic” to charge fees for his teaching.

**The mathematical sciences take no account of what things are good or bad:** See PA I 1 641<sup>b</sup>10–12, M 3 1078<sup>a</sup>31–<sup>b</sup>5.

## Note 273

**The for-the-sake-of-which is the function (*ergon*):** A function is: (1) an activity that is the use or actualization of a state, capacity, or disposition; (2) a work or product that is the further result of such an activity (NE I 1 1094<sup>a</sup>5–6). It is intimately related, as here, to its possessor’s end or final cause: “The function is the end, and the activity is the function” (⊙ 8 1050<sup>a</sup>21–22); “each thing that has a function is for the sake of its function” (*Cael.* II 3 286<sup>a</sup>8–9). Moreover, a thing’s good or doing well “seems to lie in its function” (NE I 7 1097<sup>b</sup>26–27). But this holds only when the thing itself is not already something bad (⊙ 9 1051<sup>a</sup>15–16). Finally, a thing’s function is intimately related to its nature, form, and essence. For a thing’s nature is “its for-the-sake-of-which” (*Ph.* II 2 194<sup>a</sup>27–28), its form is more its nature than its matter (II 1 193<sup>b</sup>6–7), and its essence and form are the same (Z 7 1032<sup>b</sup>1–2). Hence “all things are defined by their function” (*Mete.* IV 12 390<sup>a</sup>10), with the result that if something cannot function, it has no more than a name in common with its functional self (Z 10 1035<sup>b</sup>14–25, *Pol.* I 2 1253<sup>a</sup>20–25, PA I 1 640<sup>b</sup>33–641<sup>a</sup>6). Functions are thus attributed to a wide variety of things, whether living or non-living. These include plants (*GA* I 23 731<sup>a</sup>24–26) and animals generally (NE X 5 1176<sup>a</sup>3–5), including divine celestial ones (*Cael.* II 3 286<sup>a</sup>8–11), parts of their bodies and souls (PA II 7 652<sup>b</sup>6–14, IV 10 686<sup>a</sup>26–29), instruments or tools of various sorts (*EE* VII 10 1242<sup>a</sup>15–19), crafts, sciences (II 1 1219<sup>a</sup>17), philosophies (Z 11 1037<sup>a</sup>15) and their practitioners (NE VI 7 1141<sup>b</sup>10), cities (*Pol.* VII 4 1326<sup>a</sup>13–14), and nature itself (*Iota* 10 1258<sup>a</sup>35).

**The form is the account:** Or, more precisely, the ontological correlate of the account (Δ 6 1015<sup>b</sup>25n).

## Note 274

**Based on our earlier determinations about which of the sciences should be called wisdom, there is reason to apply the term to each:** At A 2 982<sup>a</sup>8–19.

## Note 275

**The science of the end and of the good is of the same sort as wisdom:** “Since we have a theoretical grasp on more than one cause of natural coming to be—for

example, both on the one for the sake of which and on the one from which comes the starting-point of movement, we also need to determine about these causes which sort is first and which sort second. But it is evident that first is the one we call ‘the for-the-sake-of-which.’ For this is an account of the thing, and the account is a starting-point alike in the things composed in accord with craft and in those composed by nature. For once the doctor has defined health and the builder has defined a house, whether by thought or by perception, they give the accounts and the causes of each of the things they produce, and why they must be produced in this way. Yet the for-the-sake-of-which and the good are present more in the works of nature than in those of craft” (PA I 1 639<sup>b</sup>11–21).

#### Note 276

**Wisdom was determined to be about the primary causes:** At A 2 982<sup>a</sup>30–<sup>b</sup>2.

#### Note 277

**Even those of which there are demonstrations:** Reading καὶ ὧν ἀποδείξεις εἰσὶ, which OCT brackets for deletion.

**Demonstrations:** See A 1 981<sup>a</sup>3n(3–6).

**We think that there is knowledge of each thing when we know what it is:** “It is reasonable that, after the (primary) substances, their species and genera are alone among the others said to be (secondary) substances, since they alone make the primary substance clear. For if one is to give the what-it-is of a particular human [that is, a primary substance], it will be appropriate to give the species or the genus—though more conducive to knowledge to produce ‘human’ as an answer than to give ‘animal.’ To give any of the others, however, would be out of place—for example, to give ‘white’ or ‘runs’ or anything like that. So it is reasonable that these should be the only other things said to be substances” (Cat. 5 2<sup>b</sup>29–37).

**What squaring a rectangle is, namely, that is the finding of a mean:** What is squaring the rectangle? Squaring the rectangle =<sub>def</sub> the finding of a geometrical mean between the sides. The demonstration in this case would show that a rectangle can be squared in this way (see Z 17 1041<sup>a</sup>32–<sup>b</sup>10).

#### Note 278

**Common beliefs:** Propositions commonly (and perhaps tacitly) accepted by all people who construct proofs, but also propositions common to all sciences, and thus believed by those who know these sciences (Γ 3 1005<sup>a</sup>22–24).

**It is impossible at the same time to both be and not be, and any other propositions (protaseis) like that:** A *protasis* in the narrow sense is the premise of a syllogism, but here, as often elsewhere, it is simply a proposition—“a statement (*logos*) affirming or denying something of something” (APr. I 1 24<sup>a</sup>16–17; also APo. I 2 72<sup>a</sup>8–9).

#### Note 279

**There will have to be some hypothesized genus, as well as attributes, on the one hand, and axioms pertaining to them, on the other:** “Every demonstrative science is concerned with three things: what it posits to exist (these constitute the genus of whose intrinsic attributes it gets a theoretical grasp); the so-called



common axioms (that is, the primary things on which the demonstrations are based); and third, the attributes, where it gets hold of what each of them signifies. But certainly nothing prevents some sciences from ignoring some of these—for example, they need not hypothesize the existence of the genus, if it is evident that it exists (for it is not equally clear that numbers exist as that hot and cold do), nor need they get hold of what the attributes signify insofar as these are clear. In the same way, in the case of the common items, they need not get hold of what ‘to remove equals from equals’ signifies. Nonetheless, by nature at any rate, there are these three things: that about which the science shows things, the things it shows, and the things on the basis of which it shows them” (*APo.* I 10 76<sup>b</sup>11–22; also I 7 75<sup>a</sup>39–<sup>b</sup>2, I 28).

**Axioms (*axiōmata*):** “An immediate deductive starting-point I call a posit if we cannot show it but it is not necessary for anyone who is to learn anything to grasp it; and one that it is necessary for anyone who is to learn anything whatever to grasp, I call an axiom (since there are some things of this sort), for we are accustomed to use this name especially of such things” (*APo.* I 2 72<sup>a</sup>14–18).

**Since it is impossible for there to be demonstrations of everything:** “We say that not all scientific knowledge is demonstrative, but in the case of the immediates it is non-demonstrable. That this is necessarily so is evident. For if it is necessary to have scientific knowledge of the things that are prior and on which the demonstration depends, and it comes to a stop at some time, it is necessary for these immediates to be non-demonstrable. About this, then, that is what we say. And we also say that there is not only scientific knowledge but some starting-point of scientific knowledge by which we come to know the definitions (*horous*) [for which there is no argument]” (*APo.* I 3 72<sup>b</sup>18–25; also *NE* VI 7 1142<sup>a</sup>25–26).

#### Note 280

**Has more control and is prior:** See A 2 982<sup>b</sup>7n, and on control more generally, A 1 981<sup>b</sup>11n.

#### Note 281

**If not to the philosopher, then to whom does it belong to get a theoretical grasp on what is true and what is false about the axioms?:** Aristotle answers at I 3 1005<sup>b</sup>5–8.

#### Note 282

**It is not reasonable that there should be one science of all substances, since then there would be one demonstrative science of all intrinsic coincidents:** If there were a single science of the attributes, there would—for reasons canvassed in relation to Puzzles 1 and 2—have to be a single genus of substances, which there is not.

#### Note 283

**To get a theoretical grasp on the intrinsic coincidents of the same genus by depending on the same beliefs does belong to the same science:** That is, on the same axioms—the ones relevant to demonstrating the attributes of the genus in question.

Note 284

**Of the what about there is one science and of the from which there is one science too:** The what about is the single genus of beings that constitutes the science's subject matter; the from which are the common axioms that demonstrations in the science depend on (*APo.* I 10 76<sup>b</sup>11–22).

**The coincidents are also theoretically grasped either by these sciences or by one composed of them:** The sciences referred to are the one dealing with the genus and the one dealing with the common axioms relevant to it. We can take these either severally or jointly (in which case they form one science).

Note 285

**The theoretical knowledge (*theōria*):** That is, the theoretical science of being qua being.

Note 286

**If the solid is a sort of substance and so are lines and planes:** The conditional is illustrative. Aristotle does not think that solids, lines, planes, or similar objects of mathematics are substances (*M* 2 1077<sup>a</sup>24–<sup>b</sup>14).

**Does it belong to the same science to know these and the [intrinsic] coincidents of each genus:** The coincidents in question here and at 997<sup>a</sup>33 must be the intrinsic ones, since no science deals with mere coincidents, which, because they hold by luck or chance rather than of necessity, cannot be demonstrated: "Of coincidents that are not intrinsic in the way in which the intrinsic ones were defined, there is no demonstrative scientific knowledge. For we cannot show the conclusion from necessity, since it is possible for what is coincidental not to belong" (*APo.* I 6 75<sup>a</sup>18–21).

Note 287

**There does not seem to be a demonstration of the what-something-is:** A demonstrative science is concerned with the intrinsic coincidents of a single genus. If that same demonstrative science also deals with the substances in the genus as opposed to these attributes, it would have to demonstrate their essential definition, or the what-it-is, of each of them. But since these are starting-points of the science's demonstrations, the science cannot be a *demonstrative* science of them (*APo.* II 3–8).

Note 288

**This is a very difficult question:** If the science being inquired about deals with substances (and their essential definitions) but not with the intrinsic coincidents of those substances, what science will deal with the latter? What will it construct its demonstrations from if not from substances and their essential definitions?

Note 289

**The way in which we say that the Forms are both causes and intrinsically substances:** See A 9 990<sup>b</sup>9n.

**Has already been stated in our first accounts of them:** A 6, 9.

Note 290

**The heaven as a whole (*ouranos*):** See A 5 986<sup>a</sup>3n.

**These are the same as perceptibles except that they are eternal whereas the latter pass away:** Plato explicitly classes Forms as intelligible not perceptible: “[Socrates] We say that there are many beautiful, many good, and many other such things, thereby distinguishing them in words. [Glaucon] We do. [S.] We also say there is a beautiful itself and a good itself. And so, in the case of all the things that we then posited as many, we reverse ourselves and posit a single Form belonging to each, since we suppose there is a single one, and call it what each is. [G.] That’s true. [S.] And we say that the one class of things is visible but not intelligible, while the Forms are intelligible but not visible” (*Rep.* VI 507b1–9). Since Aristotle can hardly have been unaware of this, his criticism is presumably that it is nonetheless entailed that the difference between perceptible and intelligible amounts to little more than that between things that pass away and eternal things. One likely vehicle of this entailment is mentioned in *Iota* 10: “It is evident, therefore, that there cannot be Forms of the sort that some people say there are, since then one man would be capable of passing away and another incapable of passing away. Yet the Forms are said to be the same in form with the particulars and not merely to have the same name” (1059<sup>a</sup>10–14). The issue in P4, moreover, is precisely that of whether there are any substances beyond perceptible ones, making the perceptibility of the Forms particularly relevant.

#### Note 291

**They say that there is man-itself and horse-itself and health-itself, and nothing else (*allo d'ouden*):** *Allo d'ouden* could mean: (1) they say nothing else about man-itself and the rest except that they exist; (2) they say that man-itself is man and not anything other than man, and similarly for the others; or (3) they say that man-itself is man taken by himself, with nothing added that is extraneous to what makes him a man, and similarly for the others. The following text seems to favor (3): “We say that there are many beauties (*polla kala*), many goods (*polla agatha*), and so on for each such thing, thereby distinguishing them in an account. . . . We also say there is beauty-itself and good-itself, and so on for all the things that we then posited as many. Now we reverse ourselves and posit a single Form of each, since we suppose there is a single one, and call it what each is (*‘ho estin’ hekaston*). . . . And we say that the former are visible but not intelligible, while the Forms are intelligible but not visible” (Plato, *Rep.* VI 507b1–9).

#### Note 292

**If indeed astronomy is one of the mathematical sciences:** As Plato thinks it is: “[Socrates] In my opinion, your conception of ‘higher studies’ is a good deal too generous! I mean, if someone were looking at something by leaning his head back and studying ornaments on a ceiling, it seems as though you would say that he is looking at them with his understanding, not with his eyes! Maybe you are right and I am foolish. You see, I just cannot conceive of any subject making the soul look upward except the one that is concerned with being—and that is *invisible*. If anyone tries to learn something about perceptibles, whether by gazing upward or squinting downward, I would say that he never really learns—since there is no knowledge to be had of such things—and that his soul is not looking up but down, whether he does

his learning lying on his back on land or on sea! [*Glaucón*] A fair judgment! You are right to reproach me. But what did you mean, then, when you said that astronomy must be learned in a different way than people learn it at present, if it is going to be useful with regard to what we are talking about? [*S.*] It is like this: these ornaments in the heavens, since they are ornaments in something visible, may certainly be regarded as having the most beautiful and most exact motions that such things can have. But these fall far short of the true ones—those motions in which the things that are really fast or really slow, as measured in true numbers and as forming all the true geometrical figures, are moved relative to each other, and that move the things that are in them. And these, of course, must be grasped by reason and thought, not by sight. Don't you agree? [*G.*] Of course. [*S.*] Therefore, we should use the ornaments in the heavens as models to help us study these other things. It is just as if someone chanced to find diagrams by Daedalus or some other craftsman or painter, which were very carefully drawn and worked out. I mean, anyone experienced in geometry who saw such things would consider them to be very beautifully executed, I suppose. But he would think it ridiculous to examine them seriously in order to find there the truth about equals, doubles, or any other ratio" (*Rep.* VII 529a9–530a2). Some of Aristotle's views on the topic are expressed in A 8.

**Heaven** (*ouranos*): See A 5 986<sup>3</sup>n.

#### Note 293

**How are we supposed to believe these things** (*toutois*): Or, how are we supposed to believe these *people*.

#### Note 294

**Optics . . . harmonics**: These sciences deal with mathematical aspects of (respectively) visible and audible objects, which, if they are intermediates, will be beyond—and so not identical to—familiar perceptibles.

#### Note 295

**There will also be animals that are intermediate between the animals themselves and the ones that pass away**: The animals that pass away—the animals that exist here—have the familiar five perceptual capacities that detect the familiar perceptibles. The intermediate perceptibles, as different from the familiar ones, would have to be detected by perceptual capacities other than the familiar five, since perceptual capacities are individuated and defined by their objects (*DA* II 4 415<sup>14</sup>–22). These new intermediate perceptual capacities, in turn, would have to be possessed by new intermediate animals.

#### Note 296

**If geometry** (*geōmetria*) **is to differ from measurement** (*geōdaisia*): Strictly speaking *geōdaisia* means “land measurement” or “surveying,” but here is used in a more general sense.

#### Note 297

**Not even this is true, namely, that measurement is of perceptible magnitudes that pass away, since then it would pass away when they did**: Even “applied”

sciences or crafts, like measurement, involve claims that reach beyond particulars to some sort of universals (A 1 981<sup>a</sup>15–16).

#### Note 298

**A circular hoop makes contact with a ruler not at a point but as Protagoras used to say it did when refuting the geometers:** A hoop looks as if it makes contact with a ruler not at a dimensionless point but along a short line. By appeal, presumably, to his principle that “man is the measure of all things” (Iota 1 1053<sup>a</sup>36), Protagoras inferred—perhaps in the work on mathematics attributed to him (*DL* IX [47] 190–202)—that geometry is based on falsehoods (N 2 1098<sup>a</sup>22–23).

**Protagoras of Abdera** (c. 490–c. 420 BC): A famous sophist, who was perhaps the first to describe himself as such and to charge fees for his teaching (Plato, *Prt.* 317b, 349a). His best-known view is discussed in Γ 5 1009<sup>a</sup>6–16.

**Spirals:** The supposed paths of the planets (Plato, *Ti.* 38e–39b).

#### Note 299

**There are some, however, who say that these so-called intermediates . . . exist, although not *separate* from perceptibles but rather in them:** It is not clear to whom Aristotle is referring. On what separability amounts to for substances, see Z 1 1028<sup>a</sup>34n.

#### Note 300

**Whether it is the genera that we should take to be elements and starting-points or rather the primary components present in each thing:** Elements and starting-points are the same for Platonists, who “make every starting-point an element” (N 4 1092<sup>a</sup>6–7). Aristotle’s own complex views of their relationship to each other and to cause are found in Δ 1–3.

#### Note 301

**Voiced sound (*phônê*):** Aristotle sometimes contrasts *phōnos* (“sound in general”) from the *phônê* (“cry” or “voice”) of an animate being—“*Phônê* is a sort of sound characteristic of something animate” (*DA* II 8 420<sup>b</sup>5–6)—and sometimes distinguishes *phônê* from *logos* (“rational speech,” “language”): “The *phônê* is an indicator of what is pleasant or painful, which is why it is also possessed by the other animals (for their nature does extend this far, namely, to having the perception of pleasure and pain and signifying them to each other). But *logos* is for making clear what is advantageous or harmful, and so also what is just or unjust” (*Pol.* I 2 1253<sup>a</sup>10–15). Here, however, he seems to be thinking of voiced sound as something distinct from animal cries. See also Iota 1 1053<sup>a</sup>16–17n.

**Not the common [genus]—voiced sound:** Compare A 1 1069<sup>a</sup>29–30.

#### Note 302

**We speak of the elements of diagrams (*diagrammatôn stoicheia*) as those things whose demonstrations are present in the demonstrations of the other things:** A *diagramma* is: (1) a diagram or figure (*Cat.* 12 14<sup>a</sup>38<sup>a</sup>1); (2) the construction of such a figure as part of a demonstration (*NE* III 3 1112<sup>a</sup>20–21); or (3), as here, the demonstration partly effected by appeal to the construction (Θ 9 1051<sup>a</sup>21–30).

What makes a demonstration elemental is that it plays a foundational role in all or most others, something it is able to do because “the primary elements are generally easy to show provided that the relevant definitions—what a line is and what a circle—have been posited” (*Top.* VIII 3 158<sup>b</sup>35–37).

Note 303

**Insofar as we know each thing through definitions:** Reading ἥ (“insofar as”) for OCT ei (“if we know each thing through definitions”).

**The genera are the starting-points of definitions:** See  $\Delta$  28 1024<sup>b</sup>4–6.

**The genera must also be the starting-points of the definable things:** See  $\alpha$  1 993<sup>b</sup>30–31.

Note 304

**The genera are starting-points at any rate of the species:** “A thing must be defined through its genus and differentia for the definition to be correct, since these things are unconditionally more knowable and prior to the species. For if we do away with genus and the differentia, then species are done away with, so that these are prior to the species” (*Top.* VI 4 141<sup>b</sup>25–29).

Note 305

**The account of the substance is one:** See Z 4 1030<sup>b</sup>8–9n.

**The definition by means of genera will be distinct from the definition that states the components present in a thing:** See Z 12 1037<sup>b</sup>28n.

Note 306

**Is it the primary genera that we should acknowledge as starting-points:** The primary genera are the categories (quantity, quality) and so on, which are referred to as such at *APo.* II 13 96<sup>b</sup>20–21, Z 9 1034<sup>b</sup>9.

**Or the ultimate ones, which are predicated of the indivisibles (*tôn atomôn*):** Here and at 999<sup>a</sup>15 the *atoma*, as subjects of predication, are particulars. At 998<sup>b</sup>29 and 999<sup>a</sup>12 they seem to be indivisible species.

Note 307

**Of all beings:** Reading τῶν ὄντων which OCT brackets for deletion.

Note 308

**It is impossible . . . for the species of the genus to be predicated of their own proper differentiae:** “The differentia is predicated more extensively than the species, as rational and mortal are than human. But it is impossible for what is said less extensively to be truly predicated of what is said more extensively. . . . Further, the species is something complex, whereas the differentia is a part (*meros*) of the complex. Further, the differentia is a portion (*morion*) of the species, to the extent that each of the items in a definitional account is a portion of that thing whose substance [= essence] it joins in completing, that is, a non-homoeomerous portion (for in a definition the genus does not signify the same thing as each of the differentiae). But such a whole is not predicated of its parts” (*Alex. In. Metaph.* 205.17–26 = Dooley & Madigan, 143).

**It is impossible . . . for the genus to be predicated without its species:** “If animal is to be predicated of each of its differentia, many animals (*polla zô[i]a*) will be predicated of the species. For the differentiae are predicated of the species. Further, the differentiae will be all either species or indivisible things (*atoma*) [= particulars], if they are animals, since every animal is either a species or an indivisible thing” (*Top.* VI 6 144<sup>a</sup>36–<sup>b</sup>3). The idea is this: Suppose human is defined as animal (*genus*) that is two-footed (*differentia*<sub>1</sub>) and rational (*differentia*<sub>2</sub>). Then human ≠ two-footed, human ≠ rational, two-footed ≠ rational. So if animal is predicated of two-footed and rational, then two-footed is one species of animal (*animal*<sub>1</sub>) and rational is another species of animal (*animal*<sub>2</sub>). So human will be *animal*<sub>1</sub> and *animal*<sub>2</sub> and so will be many animals of the same genus but of different species.

#### Note 309

**The intermediate ones, taken together with the differentiae, will also be genera, down to the indivisible ones, but as things stand some seem to be genera and others do not:** “Each of the differentiae present in the indivisible species, combined with the genus of which it is a differentia, makes a genus. For each of the genera intermediate between the primary genus and the indivisible species, combined with its proper differentia, makes a genus, even if this does not seem so in some cases, because the genus of that thing has not received a name of its own. For this is what is meant by ‘some seem to be genera and others do not.’ For winged animal is a genus, just as animal is, even if it does not seem to have been named. Or he meant ‘some seem to be genera and others do not’ in the sense that, as he said in the first book of *On Animals* [= *PA* I 3 642<sup>b</sup>22–26], it is only the differentiae that are lacks which, when combined with genera, do not produce species or genera, since they do not make anything definite clear” (*Alex. In. Metaph.* 207.13–20 = Dooley & Madigan, 146).

#### Note 310

**The differentiae will be starting-points to a still higher degree than the genera:** “If the relation between species and genus is like the relation between part and whole, and if a part is anterior and prior to a whole as a result of a natural priority (for if a part is assimilated, the whole is assimilated, in that no whole will remain if one of its parts is lacking), whereas a part will not [necessarily] be assimilated if [its] whole is assimilated (because it is possible that certain parts be annulled while others remain), a species is likewise indubitably prior to the genus” (Xenocrates, F42 Isnardi). Aristotle himself does not accept this view (998<sup>b</sup>8n), but raises it as a problem for those who treat the one as a starting-point. Xenocrates of Chalcedon was a follower of Plato, and head of the Academy from 339 to 314 BC.

#### Note 311

**Everything that is indivisible is so either in quantity or in species, and what is so in species is prior:** To be indivisible in quantity or quality is to be one; but one is a measure primarily of quantity (*Tota* 1 1053<sup>b</sup>4–8). To be one in quantity, however, something must be one F, where F is a kind or species, so that before anything can be one it must be an F, making being indivisible in species the prior notion.

**The human is not the *genus* of particular humans:** Lower kinds are less divided into sub-kinds than higher kinds and so are to a higher degree one, or more unified. It might be replied that the lowest kind (human, in the example) is in fact most divided because it divides into all the particular instances of the kind (the particular men). This is division in quantity, however, not in species. In species, the human genus does not divide into particular humans, but into human sub-species. On “the human,” see Z 8 1033<sup>b</sup>25n.

Note 312

**In the case of things among which there is priority and posteriority, what is over them cannot be something beyond them:** “In things where there is priority and posteriority, there is not some common thing beyond these and separate from them. For, then, there would be something prior to the first, since the common separate thing would have priority because, if the common one were destroyed, the first would be destroyed. For example, if multiplication by two is the first case of multiplication, the multiplication predicated of all of them in common cannot be separate from them, since it would then be prior to multiplication by two” (EE I 8 1218<sup>a</sup>1–8; also NE I 6 1096<sup>a</sup>17–19).

Note 313

**If two is the first of the numbers:** Since it is the first plurality (Iota 6 1056<sup>b</sup>25–27, M 9 1085<sup>b</sup>10).

Note 314

**Further, in the case of things among which there is priority and posteriority . . . there seem to be genera:** This argument (999<sup>a</sup>6–12) is thought to be part of a fragment of Xenocrates (= F41 Isnardi).

Note 315

**Among the indivisibles (*atomois*), one is not prior and another posterior:** The *atoma* here are individuals, not indivisible species.

Note 316

**Where one thing is better and another worse, the better is always prior:** “What is better and more estimable seems to be prior in nature; and ordinary people commonly say of those they find especially estimable and especially love that they ‘come first.’ This, we might say, is pretty much the least strict way of being prior” (Cat. 12 14<sup>b</sup>5–7).

Note 317

**In what way we should take these to be starting-points:** “These” are the species predicated of indivisible particulars.

Note 318

**The starting-point, or the cause, must exist beyond the things of which it is a starting-point and must be capable of existing as separated from them:** This is so for Plato and Platonists, but not for Aristotle (Δ 1 1013<sup>a</sup>7–10, 3 1014<sup>b</sup>14–15).



## Note 319

**There is a puzzle, most difficult of all and most necessary to get a theoretical grasp on:** With P8, P11 (1001<sup>a</sup>4–5), and—by implication—P10 (1000<sup>a</sup>5–6) are singled out as especially difficult.

## Note 320

**We just went through a puzzle:** See B 3 P7.

## Note 321

**There will be nothing intelligible, but all will be perceptible:** See A 1 981<sup>a</sup>6n.

**There will be no scientific knowledge:** See A 1 981<sup>a</sup>3n.

## Note 322

**If neither the substance (*ousia*) nor the matter is to exist:** Here, as the next sentence shows, *ousia* should be understood as essence (= shape, or form).

## Note 323

**All things are one of which the substance is one:** The substance of man for a Platonist is man-itself, which is a substantial particular. The substance of A, however, cannot be separate from A, since it must be present in it (A 9 991<sup>a</sup>13). So if man-itself is present in A and B, A and B cannot be separate from each other and so must be identical.

## Note 324

**Are they many and different? But this too is unreasonable:** “They” are entities such as man-itself, which are the substance of a corresponding many. So if they are many and different, then there will be man-itself<sub>1</sub>, man-itself<sub>2</sub>, and so on. Aristotle does not explain why this would be strange, but a reasonable assumption is that it is because it leads to the *Third Man* (A 9 990<sup>b</sup>17). P9, which investigates the ways in which the starting-points can be one (and so also many), may be in part an elaboration of this issue.

## Note 325

**In what way does the matter come to be each of these things (*toutôn*), and in what way is the compound (*to sunolon*) both these things (*tauta*)?:** *Toutôn* refers to the various compounds of form (essence) and matter; *tauta* to form and matter themselves.

## Note 326

**If they are one in form [only], nothing will be one in number:** We explain why something is “one in number” ultimately by appeal to starting-points whose own capacity to cause other things to be one in number requires no further explanation, because they themselves are intrinsically one, or intrinsic unities (A 1 993<sup>b</sup>23–32). If the starting-points are one in form only, there can be no such explanation, since things that are “one in form are not all one in number” (Δ 6 1016<sup>b</sup>36), so that nothing will be one in number.

Note 327

**How will there be scientific knowing, if there does not exist something that is a one over all (*hen epi pantôn*)?** Here, as at 999<sup>b</sup>20, *panta* means not all things generally, but all things of a certain sort, such as all men. If there is not a one over any many, then there is no universal common to its members, and so no scientific knowledge, since “the sciences are said to be—and in fact are—of what is common” (NE X 9 1180<sup>b</sup>15–16).

Note 328

**P9:** Suppose that A, B, C, as the only letters of the alphabet, are the starting-points of all syllables or voiced sounds (Aristotle seems to think first of written syllables and then of spoken ones). If any particular inscription of A is the same in number, rather than in form, as the starting-point A, there can be only one inscription of A, so that A, B, C will (in some order) be all the literature (spoken or written) that there can be.

Note 329

**How (*pôs*) is it that some things can pass away, whereas others cannot pass away, and due to what cause (*dia tin' aitian*)?** In what follows Hesiod might be taken to specify the cause (eating ambrosia and drinking nectar), but not the how, Empedocles to specify the how (the operations of love and strife), but not the cause.

Note 330

**If it is for the sake of pleasure that the gods touch these:** We expect “taste” rather than “touch,” but for Aristotle taste is a sort of touch, “since taste is of food and food is a tangible body. Sound, color, and smell do not nourish, nor do they produce either growth or withering. So taste too must be a sort of touch, because it is a perception of what is tangible and nourishing” (DA III 12 434<sup>b</sup>18–22).

**If these *are* the cause of their being, how could the gods be eternal, since they need nourishment:** Eternal beings are intrinsically eternal not accidentally eternal. If they need nourishment to be eternal, however, they are not intrinsically eternal, since their eternity depends not on what they are intrinsically but on something else.

Note 331

**At any rate, he says:** DK B21 = TEGP 45 F22.

**From which all things—those that were, those that are, those that will be hereafter:** Reading ἐξ ὧν πάνθ' ὅσα τ' ἦν ὅσα τ' ἔσθ' ὅσα τ' ἔσται ὀπίσω for Οἱ τ' ἐξ ὧν πάνθ' ὅσα τ' ἔστιν.

Note 332

**“Strife was taking a stand at the lastmost place”:** DK B36 = TEGP 52 F29. Explained in DK B35 = TEGP 51 F28. When the elements, under the control of love, have all come together, love is at the center of the vortex, whereas strife is banished to the lastmost place—“the uttermost bounds of the circle.”

## Note 333

**“For by earth . . .”:** DK B109 = TEGP 158 F110. Quoted more fully at DA I 2 404<sup>b</sup>12–15. The passage is otherwise unattested.

## Note 334

**“But when great strife . . .”:** DK B30 = TEGP 59 F34. Otherwise unattested.

## Note 335

**P11:** Compare Iota 2 1053<sup>b</sup>9–16, where the puzzle concerns whether being and the one are substances or attributes of substances. Here the question is whether they are at once substances and the essences of the beings of which they are predicated.

**The one that is most difficult even to get a theoretical grasp on:** Compare 999<sup>a</sup>24–25.

**The one most necessary for knowledge of the truth:** See A 3 983<sup>b</sup>3n.

**Whether each of them is—not by being a another thing (*ouch heteron ti on*)—one and being respectively, or whether . . . some other nature underlies them as subject:** For the meaning of *ouch heteron ti on*, used here and at 1001<sup>a</sup>10, see A 6 987<sup>b</sup>23n.

**Whether being and the one are substances of the beings (*ousiai tôn ontôn*):** See A 5 987<sup>a</sup>13–19.

## Note 336

**For Plato and the Pythagoreans think that neither being nor the one is another thing:** See A 5 987<sup>a</sup>13–19.

## Note 337

**If it is substance, the puzzle is the same as that concerning being:** If the one-itself is substance, what is different from it is not one of anything, just as what is different from being is *not* (= lacks being).

## Note 338

**Zeno’s axiom:** Zeno of Elea (DK 29 = TEGP pp. 245–70) was a follower and defender of Parmenides.

## Note 339

**P14:** In the list of puzzles given in B 1, P14 (996<sup>a</sup>13–15) has a second component: “and if they are substances, are they separate from the perceptible ones or components present in them?” P4 discusses the separation of the intermediates posited by the Platonists as the objects of the mathematical sciences (B 2 997<sup>b</sup>2–3), but 1002<sup>a</sup>8–12 suggests that the planes and points discussed in the present puzzle are objects of mathematics, whether conceived Platonically as separate from perceptibles, or in Pythagorean fashion as material elements of them (A 5 986<sup>a</sup>1–2, <sup>b</sup>6–7, Iota 8 990<sup>a</sup>21–22), and so not separate from them (M 8 1083<sup>b</sup>10).

**Numbers, bodies, planes, and points:** In Δ 8 number is included along with plane and line as what “defines all things” (1017<sup>b</sup>20–21), and that presumably is why it

is associated with unit here (1002<sup>a</sup>5, 1002<sup>a</sup>25): every being is one something or a unit of some sort.

Note 340

*This something (tode ti)*: *Tode ti* involves a particularizing element and a generalizing element. I take the demonstrative pronoun *tode* as particularizing (as suggested by Z 4 1030<sup>a</sup>5–6) and the indefinite pronoun *ti* as generalizing, but since *tode* need not be particularizing (as it may not be at Z 7 1032<sup>b</sup>6–21) and *ti* may be (as perhaps in *to ti leukon* discussed in Γ 4 1007<sup>b</sup>4n), it is possible to go the other way and translate as “thing of a certain sort.” Often *tode ti* appears in translations simply as “a this,” and in at least one place Aristotle himself suggests that *tode* and *ti* are pretty much interchangeable (Λ 2 1069<sup>b</sup>9, 11).

(1) In very many cases, as in the present one, being a *tode ti* is a distinctive mark of *ousia* (“substance”), and so has some share in the ambiguity of the latter, as between (1a) an ultimate subject of predication and (2a) the substance or essence of something (A 3 983<sup>a</sup>27n). This is reflected in the fact that (1b) a particular man and a particular horse are primary substances (*Cat.* 5 2<sup>a</sup>11–14), so that “it is indisputably true that each of them signifies a *tode ti*” (3<sup>b</sup>10–12), while at the same time (2b) what is separable and a *tode ti* is “the shape or form of each thing” (Δ 8 1017<sup>b</sup>24–26; also H 1 1042<sup>a</sup>27–29, Θ 7 1049<sup>a</sup>35, Λ 3 1070<sup>a</sup>11, DA II 1 412<sup>a</sup>7–9). Some things, to be sure, are one and the same as their forms or essences—which would remove the ambiguity at least in their cases—but it is not true that all are (Z 11 1037<sup>a</sup>33–<sup>b</sup>7).

(3) As strong as the connection between substance and being a *tode ti* is the disconnection between being a *tode ti* and being a universal—“no common thing signifies a this something, but rather a such-and-such sort of thing” (B 6 1003<sup>a</sup>8–9; also Z 13 1039<sup>a</sup>15–16)—and the connection between being substance and being a *kath’ hekaston*: “If we do not posit substances to be separate, and in the way in which the *kath’ hekasta* are said to be separate, we will do away with the sort of substance we wish to maintain” (M 10 1086<sup>b</sup>16–19). Apparently, then, a form that is (2b) a primary substance—as some are explicitly said to be (Z 7 1032<sup>b</sup>1–2)—must be a *kath’ hekaston*.

(4) A *kath’ hekaston*, in turn, is “what is numerically one” (B 4 999<sup>b</sup>34–1000<sup>a</sup>1), and so, (4a) taking “numerically one” to mean that no two things can be one and the same *kath’ hekaston*, as no two things can be you or Socrates (Z 14 1039<sup>a</sup>34), it is translated as “particular”—the argument in Z 15 1040<sup>a</sup>27–<sup>b</sup>1 hinges crucially on *kath’ hekaston* having this sense. But it is also possible to take “numerically one” to mean (4b) “indivisible” or “individual,” so that like an ultimate differentia—identified with form and substance at Z 12 1038<sup>a</sup>25–26—something is *kath’ hekaston* because it cannot be further divided or differentiated.

(5) As we try to disambiguate *tode ti*, then, we run into ambiguities that parallel the initial one in substance itself, or that are related to it. That this may be no accident but rather the heart of the issue is suggested by M 10 1087<sup>a</sup>19–21.

(6) Finally a point about matter. What *Ph.* I 7 190<sup>b</sup>24–26 refers to as “countable matter (*hulē arithmêtikē*),” and treats as a generalization of such things as the

human and the bronze, is “more of a this something,” as, no doubt, is the “this wood (*todi to xulon*) of this [box]” at Θ 7 1049<sup>a</sup>24 and the “this (*toudi*), which is bronze” at Ζ 8 1033<sup>b</sup>2, from (some or all of) which the smith makes this brazen sphere. But these are particular identifiable and countable parcels of matter—minimally shaped up by form, perhaps, but enough to count as (anyway low-grade) *tade tina*. Matter taken more generally, however, is “what not being actually a this something, is potentially a this something” (Η Ι 1042<sup>a</sup>27–28).

#### Note 341

**It is by surface, line, and point that body is defined:** See *Top.* VI 4 141<sup>b</sup>3–34.

**It seems possible for them to exist without body but impossible for body to exist without them:** See Δ 11 1019<sup>a</sup>2–4, where this way of determining priority in nature and substance is attributed to Plato. Μ 2 1077<sup>a</sup>24–<sup>b</sup>14 expresses Aristotle’s own views on the topic of the substantiality of surfaces, lines, and so on.

#### Note 342

**Most thinkers and the earlier ones thought that substance and being were body:** See Δ 8 1017<sup>b</sup>10–14, Ζ 2 1028<sup>b</sup>8–13.

**Later and seemingly wiser thinkers thought that these (*toutôn*) were numbers:**

The “later thinkers” are almost certainly Pythagoreans and Platonists, who are here lumped together as “later” than the materialists, although strictly speaking the Pythagoreans were “among these thinkers [the materialists] and before them” (Α 5 985<sup>b</sup>23), whereas the Platonists alone were later (6 987<sup>a</sup>29). The Pythagoreans thought that the starting-points of mathematics are “the starting-points of all the beings” (5 985<sup>b</sup>25–26), and the Platonists thought that Forms, whose own starting-points are the one and the indefinite dyad, are at once numbers and the causes of all the other beings, which are what they are by participating in them (6 987<sup>b</sup>10–22). The reference of *toutôn* could be (1) substance and being or (2) the starting-points of bodies and substances. But the difference between these options is perhaps more notional than real, since anyone who thinks that substance and being are X must think that the starting-points of X are the starting-points of substance.

#### Note 343

**It is impossible for lines and points to be in perceptible bodies:** See Μ 2 1076<sup>a</sup>38–<sup>b</sup>11, 8 1083<sup>b</sup>11–19.

#### Note 344

**These do not exist nor are they certain substances (*mê esti de tauta mêde ousiai tines*):** Or “These are not even certain substances either.” The idea, in either case, seems to be this. (1) Hermes (the sculpted figure) is not present in the unshaped stone as something definite, and so does not (actually) exist. (2) All shapes are present in the (unshaped) solid in the same way. (3) So the surface that determines half the solid is not present in the (unshaped) solid as something definite. (4) So the same is true of the lines, points, and units that define or determine that shape. (5) So surfaces, lines, points, and units do not (actually) exist in the (unshaped) solid as definite things. (6) So they are not certain substances either, since substances are definite actual beings (Θ 8 1050<sup>b</sup>2–3).

Note 345

**“The now” (to nun) in time:** “Necessarily too, the now—the one that is so-called not in virtue of something else but rather intrinsically and primarily—is indivisible, and this sort of now is found in every time” (*Ph.* VI 3 233<sup>b</sup>33–35).

Note 346

**P14a:** There is no analogue of P14a in B 1 or K and no focused discussion of it elsewhere in the *Metaphysics*. The argument seems to be this: (1) Perceptibles and intermediates resemble each other in that there are indefinitely many of each that are the same in form—many men, many triangles. (2) Therefore, their starting-points will also be indefinitely many. (3) By the same token, there will not be a substance that is one in number, since each of the substantial starting-points is one in form but many in number. (4) So there must be some one Form over the many perceptibles or intermediates, if there are to be so-and-so many substantial starting-points each of which is one in number.

Note 347

**The starting-points of the writings that exist here are not definite in number either, although they are in form:** See P9.

Note 348

**There will not be substance that is one in number, but in form:** Reading οὐκ ἔσται μία ἀριθμῶ ἀλλ’ εἶδαι οὐσία with Ross for OCT οὐκ ἔσται μία ἀριθμῶ οὐσία (“There will not be substance that is one in number”).

Note 349

**If we are to posit both that the Forms exist and that the starting-points are one in number, not in form, we have said what impossibilities necessarily follow:** The reference could be to the discussion in A 6 and 9 or to P9 in B 4 (999<sup>b</sup>27–1000<sup>a</sup>4).

Note 350

**Whether the elements are [causes] potentially (*dunamei*) or in some other way:** In B 1 996<sup>a</sup>10–11 P13 refers to starting-points rather than elements, suggesting that the two are treated as equivalent, and contrasts being a cause potentially with being one “actively (*energeia(i)*),” suggesting that this is the relevant “other way.” In *Ph.* II 3 195<sup>b</sup>13–28, a builder is “potentially (*kata dunamin*)” a cause of a house, whereas a builder actively building a house is “actively (*energounta*)” a cause of it. If the cosmos is conceived as having a temporal origin, as it is by most, if not all, of Aristotle’s predecessors, then the elements or starting-points must be conceived as being potentially causes (as things capable of causing but not actually causing movement or whatever), since prior to that temporal origin they are inactive.

Note 351

**The capacity (*hê dunamis*) is prior to that other cause, and not all of what is capable (*to dunaton*) of being in a certain way is in that way:** See A 9 992<sup>b</sup>15n.

## Note 352

**If the elements are [causes] potentially, it is possible that none of the other beings should exist:** (1) If the beings exist, they are caused to exist by the elements actively causing them. (2) If the beings are not actively caused to exist by the elements, none of the beings exist. (3) If it is possible that the beings are not actively caused to exist by the elements, it is possible that none of the beings exist. (4) If the elements are only causes potentially, it is possible for them not to actively cause the beings to exist. (5) If the elements are only causes potentially, it is possible that none of the beings exist. See also A 6 1071<sup>b</sup>12–1072<sup>a</sup>10, with its reference back to Θ 8.

## Note 353

**No common thing (*koinôn*) signifies a this something (*tode ti*) but a such-and-such sort of thing (*toionde*):** “Human and every common thing signifies not a this something but a such-and-such sort of thing (*toionde*) or quantity (*poson*) or relation (*pros ti*) or the like” (SE 22 178<sup>b</sup>37–39).

**Substance is a this something:** See B 5 1001<sup>b</sup>33n. Also Δ 8 1017<sup>b</sup>23–26, Z 10 1035<sup>b</sup>27–30, H 1 1042<sup>a</sup>29, Θ 7 1049<sup>a</sup>35, A 3 1070<sup>a</sup>13–14.

## Note 354

**If we are to posit that what is predicated in common is a this something and can be set out:** Reading ἐκθέσθαι with the mss. for OCT’s δεῖ ἐκθέσθαι (“if what is common is to be a this something and should be set out apart [from the particulars]”). Ross reads ἐν θέσθαι (“if what is common is to be a this something and one thing”). For an explanation of “setting out” see A 9 992<sup>b</sup>10n, and for a parallel use, SE 22 178<sup>a</sup>39–179<sup>a</sup>3: “Likewise in the case of Coriscus and musical Coriscus—are they the same or distinct? For [the sophistical argument arises because] ‘Coriscus’ signifies a this, whereas ‘musical Coriscus’ signifies a such-and-such sort of thing (*toionde*), so that it cannot be set out (*ouk estin auto ekthesthai*).” Z 6 1031<sup>b</sup>18–1032<sup>a</sup>11 is a second parallel (notice *ekthesin* at 1031<sup>b</sup>21).

**Socrates will be many animals:** Reading ζῶα (“animals”), which OCT brackets for deletion. Socrates will be many animals because he is himself (and he is an animal<sub>1</sub>), the human (and the human is an animal<sub>2</sub>), and the animal (and the animal is an animal<sub>3</sub>), and animal<sub>1</sub> is a this something that can be set out, as can animal<sub>2</sub> and animal<sub>3</sub>, and animal<sub>1</sub> ≠ animal<sub>2</sub> ≠ animal<sub>3</sub>. See also Z 13 1039<sup>a</sup>3–14.

## BOOK GAMMA (IV)

## Note 355

**There is a science that gets a theoretical grasp on being qua being (*to on hē[i] on*):** *Hē[i]* is usually translated “insofar as,” but here the translation “qua” seems too entrenched to alter. The science gets a grip on being itself, albeit in a special universal way—namely, qua being.

**Being (*to on*):** We think of the word “being” as having four different senses or meanings: (1) Existential “is”—where to say that something “is” means that it “exists.” This is the sense captured by the existential quantifier. (2) “Is” of identity—where to say that A “is” B means that A “is identical to” B, or A “is one and the

same thing as” B. (3) “Is” of predication—where to say that A “is” B means that “B belongs to A.” (4) Veridical “is”—where to say that something “is” means that it “is the case” or “is true.” In his account of being in  $\Delta$  7, Aristotle mentions a sort of being that corresponds to (2) (= [1], [2]) and to (4) (= [3]), and in  $\Delta$  9 and Iota 3 1054<sup>a</sup>32–<sup>b</sup>3 he has much to say about identity and sameness, including that “everything that is a being is either distinct or the same” (1054<sup>b</sup>25). (1), however, is absent from his discussion, although [4] (potential and actual being) surely bears on it, and it does seem to play some role in explaining what the separability distinctive of substance consists in ( $\Delta$  11 1019<sup>a</sup>1–4, Z 1 1028<sup>a</sup>34n(2)). One reason for this is that a demonstrative science posits the existence of the genus it investigates, and proceeds to investigate it (K 7 1064<sup>a</sup>2–4, *APo.* I 10 76<sup>b</sup>11–22, quoted in B2 997<sup>a</sup>8n), so that existence itself escapes the focus of the science—even of the science of being qua being. (This does not mean, however, that there may not be puzzles to solve before the existence of the posited genus can be taken as established—E 1 1026<sup>a</sup>23–32 is a case in point.) A second reason, though, is that until the discovery of quantifiers it was difficult to say very much about existence as such.

#### Note 356

**They must be the starting-points and causes of some nature as it is intrinsically** (*kath' hautên*): Starting-points and causes must be starting-points and causes of something. Moreover, if they are to be highest causes, they must be essences. For scientific starting-points are definitions of real essences, and what they are causes of are the intrinsic attributes (including the intrinsic coincidents) of the beings with which the science deals. Hence these causes must be intrinsic as opposed to coincidental causes. Thus “a builder is an intrinsic cause of a house, but that which is pale or knows music is a coincidental cause,” even when what is pale and knows music is (coincidentally) a builder (*Ph.* II 5 196<sup>a</sup>26–27). For the fact about the builder that scientifically explains the building of the house is not his being pale but his knowing the craft of building. Alexander in fact takes the point simply to be about intrinsic causes: “For every starting-point and every cause is a starting-point and cause of something, and this, at any rate in the full sense, is the intrinsic starting-point and cause of something and not the coincidental one. So the primary starting-points, which are starting-points in the fullest degree, would be intrinsic starting-points and not coincidental ones” (*Alex. In. Metaph.* 239.36–240.3 = Madigan, 13). It may be that he read *kath' hautas* at 1003<sup>a</sup>28 in doing so (“clearly these must be the intrinsic [starting-points and causes] of some nature”), but the point would remain even if he did not.

**Some nature** (*phuseôs tinos*): Later things that are said to be “with reference to one nature” are contrasted with things that are said to be “in accord with one thing” ( $\Gamma$  2 1003<sup>b</sup>12–14).

#### Note 357

**Something is said to be, however, in many ways** (*to on legetai pollachôs*): Literally, “being is said in many ways.” The claim is primarily an ontological claim about being, not a linguistic one about the word “being.” Just what it means will become clearer as Aristotle’s investigation of being qua being progresses.  $\Delta$  7 gives a preview.



**Not homonymously:** See A 6 987<sup>b</sup>10n.

Note 358

**Craft of medicine** (*iatrikê*): The ending *-ikê* signifies that either *epistêmê* (“science”) or *technê* (“craft”) should be supplied or presupposed, so that *iatrikê* is “the science of medicine,” or “the craft of medicine.” Since a craft is a productive science it usually does not matter much which we choose.

**Another by being naturally well disposed** (*euphuês*) **to it:** Something is *euphuês* if it is well (*eu*) grown (*phuê*), or favored by nature in capacities, appearance, or some other respect: the situation of a bodily can be *euphuês* (PA III 4 666<sup>a</sup>14), as can that of a city (Pol. V 3 1303<sup>b</sup>8); an animal can be *euphuês* as regards a function, such as reproduction (GA II 8 748<sup>b</sup>8, 12), or the acquisition of a capacity, such as bearing the cold (Pol. VII 17 1336<sup>a</sup>20), becoming a poet (Po. 17 1455<sup>a</sup>32), or a musician (EE VIII 2 1247<sup>b</sup>22). The sort relevant here is that of having the natural abilities requisite for success in medical training.

Note 359

**Lacks:** See Δ 22.

Note 360

**Of all healthy things there is one science:** Aristotle may be thinking exclusively of human health in making this claim, since he elsewhere denies that there is one science dealing with the health of animals of different species (NE I 6 1097<sup>a</sup>8–13, VI 7 1141<sup>a</sup>22–25). Alternatively, he may be relaxing—or for present purposes ignoring—the requirement that a single science must deal with a single genus (APo. I 7 75<sup>b</sup>10–11, I 23 84<sup>b</sup>17–18, 28 87<sup>a</sup>38–39), which he most recently appealed to in P1–3 in B 2.

Note 361

**For not only in the case of things that are said to be in accord with one thing** (*kath' hen*) **does it belong to one science to get a theoretical grasp on them, but also in the case of things that are said to be with reference to one nature** (*pros mian phusin*): “By ‘things that are said to be in accord with one thing’ he means the synonymous ones (*sunônuma*), the ones ranged under some one common genus. There is, he says, one science not only of these things that are related to one another in this way, but also of things that derive from one thing (*aph' henos*) and have reference to one thing (*pros hen*). But in a certain way these too have a reference back (*anaphora*) to one nature and are said to be in accord with one thing (*kath' hen*), inasmuch as this nature is somehow seen in all of them, the nature from which they derive and because of which they are said to be, even if they do not all share in it in the same way or to the same degree” (Alex. In *Metaph.* 243.31–244.3 = Madigan, 18).

Note 362

[1] Of every one genus (*genos*) there is both [1a] one perception (*aisthêsis*) and [1b] one science—for example, [2] grammar, which is one science, gets a theoretical grasp on (*theôrei*) all voiced sounds: [1b] Aristotle often says, in speaking

of the various special sciences, that a single one of them deals with a single *genos*—using *genos* in the strict sense to refer to a (first-order) genus (A 1 981<sup>a</sup>3n(5)). In the previous paragraph, however, he has argued that this requirement is too strict. When things are said to be “with reference to one nature,” there can also be a single science of them. Hence it is reasonable to follow Alexander in taking Aristotle now to be “using *genos* somewhat loosely in place of ‘one nature’” (Alex. *In Metaph.* 245.4 = Madigan, 19). This is the “one nature” that has been tentatively identified with substance, since it is with reference to it that all the other beings are said to be (1003<sup>b</sup>17–19). Compare Iota 2 1054<sup>a</sup>13–19.

[2] Grammar is supposed to be an illustration of both [1a] and [1b]—of both a single science and a single perception. The verb *theôrein*, which can be used either for an exercise of sense-perception or for an exercise of understanding or intellectual perception (A 2 982<sup>b</sup>9n), is thus here doing double duty: it is through [2a] the perceptual capacity of hearing that we perceive (*theôrein* in one sense) sounds, and through [2b] understanding (*nous*) that we get a theoretical grasp on (*theôrein* in another sense) their essences, which are the starting-points of the science of grammar.

This double duty of *theôrein* in [2] helps us to see that [1a] is employing the noun *aisthêsis* in a way analogous not to [2a] but to [2b]. Thus in [1] as a whole what we have is a contrast between [1b] the single demonstrative science that is concerned with a single *genos* or nature and [1a] what perceives—in the sense of getting a theoretical grasp on—the starting-points of that science. Since in the case of the science of being qua being the single *genos* or nature is putatively substance, what [1] more specifically claims is that there is [1b] one science of substance whose starting-points are grasped by [1a] one (sort of) understanding. The next sentence then claims that there are distinct sciences and distinct sorts of understanding that grasp the *eidê*—the species or sub-kinds—of this *genos* or nature. These are identified at 1004<sup>a</sup>2–9 and more fully at E 1 1026<sup>a</sup>18–19 with the three theoretical sciences or philosophies, theological, natural, and mathematical. Differences in the essences that are the starting-points of these three sciences, explored in E 1–4, lay the foundation for distinguishing between the sorts of understanding that grasps them. For starting-points that “do not admit of being otherwise and . . . those that do admit of being otherwise” are grasped by different parts of the soul—different sorts of understanding” (NE VI 1 1139<sup>a</sup>7–8). All this becomes somewhat clearer if, as perhaps we should, we relocate 1003<sup>a</sup>19–22 to directly precede 1004<sup>a</sup>2–9.

### Note 363

**Being and one are the same and one nature, in that they follow along with each other, just as starting-point and cause do, but not in that they are made clear by one account:** “Both starting-point and cause follow along with each other and are predicated of the same thing (for what is a starting-point is also a cause and what is a cause is also a starting-point), nonetheless the account of each is different and the focus of thought is different insofar as something is said to be a starting-point or said to be a cause (for something is said to be a starting-point insofar as it is

primary relative to what it is a starting-point of, and insofar as the things whose starting-point it is derive from it, whereas something is said to be a cause insofar as what it is a cause of is due to it, and that from which something derives (*to ex hou*) is different from that due to which it is (*to di' hou*)” (Alex. *In Metaph.* 247.9–15 = Madigan, 22).

#### Note 364

**One human and a human who is and a human are the same thing:** See Iota 2 1054<sup>a</sup>13–19.

**“He is a human and a human who is”:** Reading τὸ ἐστὶν ὁ ἄνθρωπος καὶ ἐστὶν ὢν ἄνθρωπος for OCT τὸ ἐστὶν εἰς ἄνθρωπος καὶ ἐστὶν εἰς ὢν ἄνθρωπος (“he is one human and one human who is”).

#### Note 365

**Similarly in the case of one:** We cannot separate *a* human from *one* human.

#### Note 366

**The substance is just a certain sort of being (*hoper on ti*):** Here, as often elsewhere in Aristotle, *hoper* is the opposite of *kata sumbebêkos* (“coincidentally”), and thus pretty much equivalent in meaning to “essentially,” or “intrinsically.” See *Top.* III 1 116<sup>a</sup>23–28.

#### Note 367

**“Selection of Contraries”:** The reference is probably to the work *Peri enantiôn* (Rose, F118–124 = Barnes, pp. 2427–2429) mentioned in *DL* V [22], 286.

#### Note 368

**It is necessary for there to be a primary philosophy among them and one that follows this:** E 1 1026<sup>a</sup>18–19 identifies the three theoretical philosophies as being natural philosophy, mathematical philosophy, and theological philosophy. Z 11 1037<sup>a</sup>4–6 identifies natural philosophy as secondary philosophy. *GC* 1 3 318<sup>a</sup>5–6 mentions “a distinct and prior philosophy” that gets a theoretical grasp on “the immovable starting-points” of natural or perceptible substances, which E 1 1026<sup>a</sup>29–31 identifies as primary philosophy.

#### Note 369

**Being and being one fall straightaway (*euthus*) into kinds:** See H 6 1045<sup>a</sup>36–<sup>b</sup>2.

#### Note 370

**There is a first and a second science and other successive ones within mathematics:** A reference, presumably, to the ordering of mathematical sciences on the basis of their different degrees of exactness, which, like the ordering of the various philosophies (E 1 1025<sup>b</sup>28–1026<sup>a</sup>19), is based on the involvement of matter in the essences that are their starting-points (M 3 1078<sup>a</sup>10n).

#### Note 371

**To get a theoretical grasp on the denial and the lack belongs to one science:** “Nor are ‘to be not-equal’ and ‘not to be equal’ the same. For the one of them,

that which is not-equal, has a certain underlying subject, and this is the unequal, whereas the other has none. That is why not everything is either equal or unequal, but everything is either equal or not equal. Further, 'is a not-white log' and 'is not a white log' do not belong to things at the same time. For if something is a not-white log, it will be a log, but what is not a white log is not necessarily a log. So it is evident that 'is not-good' is not the denial of 'is good.' If, then, of every single thing either the affirmation or the denial is true, and 'is not-good' is not a denial, it is clear that it must be some sort of affirmation. But every affirmation has a denial. Hence, so does this—namely, 'is not not-good'" (*APr.* I 46 51<sup>b</sup>25–35). Denial, in other words, is verb negation, whereas lack is predicate negation. Affirming "(A is not F)" is denying "A is F." Affirming "A lacks F" is affirming "A is not-F."

**We either say that unconditionally it does not belong or that it does not belong to some genus:** When we affirm that F unconditionally does not belong to A, we affirm "A is not F," but when we affirm that "A lacks F" or "A is not-F," an underlying subject is involved, as in the case of the not-white log. This underlying subject is the "some genus" referred to. For when A is not-F, it must belong to a genus that can be F or can be not-F.

**In the latter case the differentia is present beyond what is in the denial:** Reading τῷ ἐνὶ ἡ διαφορὰ πρόσεστι παρὰ τὸ ἐν τῇ ἀποφάσει marked as corrupt in OCT. When we affirm "A lacks F" (the latter case), there is an underlying genus, G, to which A must belong. Since belonging to G is what makes it possible for A to have F or to lack F, having F or lacking F must both entail being G, so that F must be a differentia of G. This is not true when we affirm "A is not F"

**And [since to repeat] plural is opposed to one:** Retaining τῷ δὲ ἐνὶ ἀντίκειται πλῆθος.

#### Note 372

**Which was one of the very puzzles discussed:** Retaining ὅπερ ἐν ταῖς ἀπορίαις ἐλέχθη. See See B 1 995<sup>b</sup>18–27, 997<sup>a</sup>25–34 (= [P5]).

#### Note 373

**It belongs to that science to know both what each of them is and also their [intrinsic] coincidents:** For why the coincidents referred to must be the intrinsic ones, see B 2 997<sup>a</sup>30n.

#### Note 374

**There are special attributes of number qua number (*idia*):** See M 3 1078<sup>a</sup>8n.

#### Note 375

**Sophistic is only apparently wisdom:** "Sophistic . . . is a way of making money from apparent wisdom. . . . Practitioners of eristic (*eristikoi*) and sophists use the same arguments, but not to achieve the same goal. . . . If the goal is apparent victory, the argument is eristic or contentious; if it is apparent wisdom, it is sophistic" (*SE* 11 171<sup>b</sup>27–29).

**Dialecticians:** See Introduction pp. xxix–l.

**Dialecticians discuss** (*dialegontai*) **about all** [these] **things** (*hapantôn*): The verb *dialegesthai* may be intended to refer to specifically dialectical discussion, rather than (as at A 8 989<sup>b</sup>33) discussion in general.

**Because they properly belong to philosophy:** The things that properly belong to philosophy cannot be literally “all things,” since some of these belong to the special sciences, with which wisdom or philosophy (as the love of wisdom) has been explicitly contrasted in Γ 1. Instead, they are the very ones mentioned in the previous paragraphs—namely, being qua being and its intrinsic coincidents. Dialectic’s own scope is wider than this, since problems can be raised that fall outside the scope of the part of philosophy under discussion here (but see A 2 982<sup>b</sup>12n).

**Being is common to all** [of these]: See 1004<sup>b</sup>9–19 (being here = substance there). Being is not, of course, common to literally *all* the topics about which dialectical problems arise.

#### Note 376

**So sophistic and dialectic are indeed concerned with the same kind** (*genos*) **as philosophy:** “Rhetoric is not concerned with a certain definite kind (*genos*), but rather is just like dialectic” (*Rh.* I 1 1355<sup>b</sup>8–9). The kind referred to here, then, is fixed not by dialectic or sophistic, but by the part of philosophy under discussion. **Philosophy differs from dialectic in the way its capacity is employed** (*tô[ti] tropô[ti] tês dunameôs*), **and from sophistic in the life it deliberately chooses:** “Sophistic is constituted not by its capacity but by its deliberate choice. In the case of rhetoric, however, one person [is a rhetorician] in virtue of his scientific knowledge, another in virtue of his deliberate choice, whereas a person is a dialectician not in virtue of his deliberate choice, but in virtue of his capacity” (*Rh.* I 1 1355<sup>b</sup>17–21).

#### Note 377

**Dialectic employs peirastic** (*peirastikê*) **about the issues philosophy seeks to know about:** *Peirastikê* is “a type of dialectic which has in view not the person who knows (*eidota*), but the one who pretends to know but does not” (*SE* 11 171<sup>b</sup>4–6). Hence it is the type particularly useful in arguments with sophists, since they are the archetypal pretenders to knowledge and wisdom (I 165<sup>a</sup>21). And what it does is *test* them—*peirastikos* means “fitted for testing”—to see whether they have the wisdom and knowledge they claim. That is why (honest) peirastic deductions “deduce from premises that are accepted by the answerer, and that must be known by anyone who claims to have the relevant scientific knowledge (*epistêmê*)” (2 165<sup>b</sup>4–6). Premises of this sort are said to be taken “not from the things from which one knows or even from those proper to the subject in question, but from the consequences that someone can know without knowing the craft in question, but which if he does not know, he is necessarily ignorant of the craft” (11 172<sup>a</sup>21–34). In other words, such premises are not starting-points of the answerer’s science, but consequences of them. In *SE* *peirastikê* refers to honest peirastic (2 165<sup>b</sup>4–6), which uses true premises and valid deductions, but in *Top.* it refers to the capacity to test, even by using false premises and invalid deductions (for example, VIII 11 161<sup>a</sup>24–29).

## Note 378

**Let us take this referring back as established:** This remark “refers us back to what was shown in the second book of *On the Good*” (Alex. *In Metaph.* 262.18–19 = Madigan, 40).

## Note 379

**All things (*panta*) either are or are derived from (*ex*) contraries:** Aristotle rejects the view that substance (*Cat.* 5 3<sup>b</sup>24–32) and quantity (6 5<sup>b</sup>11–29) are contraries, and cites the fact that substance (which his predecessors failed to grasp) is not a contrary but an underlying subject of which contraries are predicated in rejecting the view that contraries are the starting-points of all things (N 1 1087<sup>a</sup>29–<sup>b</sup>4; see also A 10 1075<sup>a</sup>28–34). It must be, then, that substances and quantities, though not opposites, are somehow derived from them: “Even if certain things do not have contraries, as substance seems not to have, still if they are derived from contraries, then, because knowledge of each of them depends on knowledge of the things from which it is derived, knowledge of these things would consist in knowledge of the contraries from which they are derived” (Alex. *In Metaph.* 262.31–34 = Madigan, 41). This would explain why Aristotle includes substances in one of the two columns of opposites (A 7 1072<sup>a</sup>30–31). His list of opposites is not restricted, however, to those recognized by his predecessors, since it includes (for example) actuality and potentiality (1072<sup>a</sup>32). Hence he can reject the view that the traditional opposites are the ultimate starting-points while continuing to think that opposites of some sort have this status.

## Note 380

**And because of that:** Reading καὶ διὰ τοῦτο at 1005<sup>a</sup>8 as at 1005<sup>a</sup>11.

**If [3] being or one is [a] not a universal and the same over all things (*epi pantôn*) or [b] separable (*chôriston*), as presumably it is not, but [4] some things are said to be or to be one [4a] with reference to one thing, others [4b] in virtue of succession (*tô[t]i ephexês*):** In the previous sentences Aristotle has partitioned the possibilities into two cases. When F is a contrary, things are said to be F either [1] in accord with one thing or [2] in many ways but with reference to one thing. Then he excludes [1] as presumptively false. Hence the “that” in “because of that” must refer to [2], and so the same partition should be being repeated in the present clause. Hence [3] should be equivalent in meaning to [1], and [4] to [2]. However, the reference to a universal that is “the same over all things or separable” suggests that [3], and so [1], is being treated as equivalent to Platonism. Aristotle would then be partitioning the possible views of being, one, and the contraries (which all derive from them), into Platonism, on the one hand, and his own view that they are said with reference to one thing, on the other. Yet this seems to omit a third option, namely, that contraries are universals, the same in all their instances, but—like Aristotle’s own universals—are ontologically dependent on their particular instances and so not separable from them (Z 1 1028<sup>a</sup>34n). Moreover, a switch to Platonism seems too abrupt and unmotivated to be easily accepted. What is more likely, therefore, is that [3b] *chôriston* is not intended to refer to the separability attributed to Forms by Platonists and to particular substances by Aristotle, but is,

rather, intended to contrast with [4b] *tôfi* *ephexês*, whose own intended meaning is apparently to contrast things that are said to be or to be one with reference directly to the relevant substance with things that are said to be one with reference to a quality, or a quantity of that substance, and so with reference to the substance itself only in virtue of succession. For "in virtue of succession (*tôfi* *ephexês*) . . . substance is first, then quality, then quantity" (A 1 1069<sup>o</sup>20–21). On this interpretation, just as [4a] is the correct version of the false [3a], so also [4b] is the correct version of the false [3b]. Being and one would be separable, therefore, not if they were substances themselves, which is the Platonic view of them (A 6 987<sup>o</sup>22n, B 1 996<sup>o</sup>6–9 (= [P11]), but if they were always predicated directly of substances (notice *chôris* at Γ 3 1005<sup>o</sup>23).

**Because of that [to repeat], it does not belong to the geometer to get a theoretical grasp on what a contrary is, or what completeness is, or what being or one is, or same or other, except on the basis of a hypothesis (*ex hupotheseôs*):** "This is because the geometer uses them, but without having shown just what each of them is, but hypothesizes them and takes them on trust from the philosopher. For example, the geometer hypothesizes that magnitudes whose sides are proportional are similar (*analogoi*), and uses this as something he is hypothesizing, not as something he has shown, and uses equality and sameness and other such things in a similar way" (Alex. *In Metaph.* 264.9–13 = Madigan, 43). This may also seem to be what Plato has in mind in his famous criticism of mathematics: "I think you know that students of geometry, calculation, and the like hypothesize the odd and the even, the various figures, the three kinds of angles, and other things akin to these in each of their investigation, regarding them as known. These they treat as hypotheses and do not think it necessary to give any argument for them, either to themselves or to others, as if they were evident to everyone. And going from these first principles through the remaining steps, they arrive in full agreement at the point they set out to reach in their investigation" (*Rep.* VI 510c2–d3). Aristotle's view, however, is a little different. For the reason the geometer cannot get a theoretical grasp on one, similarity, and other contraries "except on the basis of a hypothesis" is that these are said with reference to one thing (or in virtue of succession). The problem lies primarily in the nature of contraries, in other words, not simply—as Plato has it—in the nature of mathematics. That is why Aristotle does think, whereas Plato does not, that when it comes, for example, to the right angle, which is proper to his science, a geometer "does inquire into what it is or what sort of thing, since he is a contemplator of the truth" (*NE* I 7 1098<sup>o</sup>27–32). The problem with contraries, as with common axioms that employ them (such as, when equals are taken from equals the remainders are equals) is that they extend beyond the proper range of mathematics to being qua being as a whole (B 2 996<sup>o</sup>33–997<sup>o</sup>2, Γ 2 1005<sup>o</sup>25–33). When artificially restricted to that range, however, geometry can get a theoretical grasp on them, "not, however, qua being, but insofar as each of them is continuous in one, two, or three dimensions" (K 4 1061<sup>o</sup>17–25), and so should be itself considered to be a part of wisdom—a part of philosophy. What "on the basis of a hypothesis" refers to, therefore, is at once this restriction and the effect it has of transforming the contraries, conceived now as attributes of being qua being, into hypotheses.

Note 381

**On what in mathematics are called “axioms”:** See B 2 997<sup>a</sup>7n.

Note 382

**There is someone further, higher than the natural scientist:** See Γ 2 1004<sup>a</sup>4n.

**Primary substance** (*tên prôtên ousian*): The notion of primary substance is first essayed in *Categories* 5, where it is characterized, in part by contrast with secondary substance, as follows: (1) No primary substance is either said of or in any subject (2<sup>a</sup>11–14). (2) All the other intrinsic beings are either said of or in primary substances, and so depend for their being or existence on them (2<sup>a</sup>34–b6). (3) A primary substance is a this something (3<sup>b</sup>10), “individual (*atomon*) and one in number” (3<sup>b</sup>12–13). (4) “It seems most distinctive” of substances “to be numerically one and the same and to be able to receive opposites” (4<sup>a</sup>10–11)—to be capable of undergoing change over time. For “nothing like this is apparent in any other case” (4<sup>a</sup>21–22). (5) Substances, like quantities, have no contraries (3<sup>b</sup>24–32). (6) Substance “does not admit of more and less,” even though a particular is more a substance than a species and a species is more a substance than a genus (3<sup>b</sup>33–5). For “one human is not more a human than another” and no human is more a human at one time than at another (3<sup>b</sup>35–4<sup>a</sup>8). (7) The definitions of the predicates formed from secondary substances (for example, “animal” and “human”) apply to everything to which the predicates apply: “the primary substances admit the definitions of the species and genera, and the species admits that of the genus” (3<sup>b</sup>2–4). (8) Secondary substances do not signify a this something but “a such-and-such sort of thing” (3<sup>b</sup>15–16). For “human and animal are said of many things” (3<sup>b</sup>17–18). Primary substances, then, are all particulars, such as Socrates and Callias, while secondary substances are the species and genera to which these belong. Such particulars are unanalyzed in *Categories*, which, like other works in the so-called *Organon* (*De Interpretatione*, *Prior and Posterior Analytics*, *Topics*, and *Sophistical Refutations*), does not mention matter. When, in the *Metaphysics*, they are analyzed as compounds of matter and form, a question arises about the basis of their primacy. Is it they that are the primary substances? Or is it one or other of their components, whether matter or form (Z 3)? It is to what emerges as primary substance at the end of this investigation that Aristotle is referring here (Z 7 1032<sup>b</sup>1–2n), since it is the subject matter of primary philosophy. This includes Aristotle’s primary god (A 2 982<sup>b</sup>22–983<sup>a</sup>11, A 8 1073<sup>a</sup>30)—a reference prefigured even in the *Organon*, where the primary substances are eternal “actualities without potentiality” (*Int.* 13 23–24) and the primary god is “an intelligible living being” (*Top.* V 6 136<sup>b</sup>7).

Note 383

**Natural science, however, is a sort of wisdom too, but it is not the primary sort:** See E 1.

Note 384

**As for the attempts of some of those who speak about the truth, as to the way in which it should be accepted, they do this because of a lack of educatedness in analytics:** See Γ 4 1005<sup>b</sup>35–1006<sup>a</sup>11.



**Lack of educatedness** (*apaidousian*): See  $\alpha$  3 995<sup>a</sup>6–16.

Note 385

**The most stable starting-point of all is the one it is impossible to be deceived about:** See K 3 1061<sup>b</sup>34–36.

Note 386

**For [the most stable] starting-point must be unhypothetical** (*anupotheton*): “By the other subsection of the intelligible [which mathematics deals with on the basis of hypotheses] I mean what reason itself grasps by the power of dialectical discussion, treating its hypotheses not as starting-points, but as genuine hypotheses (that is, stepping-stones and links in a chain), in order to arrive at what is unhypothetical (*anupotheton*) and the starting-point of everything” (Plato, *Rep.* VI 511b2–6). As Aristotle understands it, “demonstration is not related to external argument, but to the one in the soul, since neither is deduction. For one can always object to external argument, but not always to internal argument” (*APo.* I 10 76<sup>b</sup>24–25; also  $\Gamma$  5 1009<sup>a</sup>16–22). There is no obstacle, therefore, to treating PNC as a hypothesis in an external argument. But there is an obstacle to so treating it in an internal one, since one cannot treat as a hypothesis in an internal argument what one cannot be deceived or fooled about. Anyone who denies PNC, then, must in fact believe it, even if in words he disavows doing so. A defense of PNC against him can at most get him to recognize his commitment. It cannot—except in cases of confusion—constitute his reason for believing it in the first place, since no reason is more basic than it.

Note 387

**It is impossible for the same thing at the same time to belong and also not to belong to the same thing and in the same respect:** Here  $PNC = PNC_1$ . It is not possible that B belongs to A and that B does not belong to A. Later PNC is expressed in terms not of contradictories but of contraries =  $PNC_2$ . It is not possible that B belongs to A and that not-B belongs to A. See  $\Gamma$  2 1004<sup>a</sup>12n. The relationship between  $PNC_1$  and  $PNC_2$  is discussed in  $\Gamma$  6 1011<sup>b</sup>15–22.

**Let us assume that we have also added as many other qualifications as might be needed:** In the case of PNC, the need for such qualifications was already recognized by Plato: [Socrates] Is it possible for the same thing, at the same time, and in the same respect, to be standing still and moving? [Glaucon] Not at all. [S.] Let's come to a more precise agreement, in order to avoid disputes later on. You see, if anyone said of a person who is standing still but moving his hands and head, that the same thing is moving and standing still, we would not consider, I imagine, that he should say that; but rather that in one respect the person is standing still, while in another he is moving. Isn't that so? [G.] It is. [S.] Then, if the one who said this became still more charming and made the sophisticated point that spinning tops, at any rate, stand still as a whole at the same time as they are also in motion, when, with the peg fixed in the same place, they revolve, or that the same holds of anything else that moves in a circle on the same spot—we would not agree, on the grounds that in such situations it is not in the same respects that these objects are both moving and standing still. On the contrary,

we would say that these objects have both a straight axis and a circumference in them, and that with respect to the straight axis they stand still—since they do not wobble to either side—whereas with respect to the circumference they move in a circle. But if their straight axis wobbles to the left or right or front or back at the same time as they are spinning, we will say that they are not standing still in any way. [G.] And we would be right. [S.] No such objection will disturb us, then, or make us any more likely to believe that the same thing can—at the same time, in the same respect, and in relation to the same thing—undergo, be, or do opposite things. [G.] They won't have that effect on me at least. [S.] All the same, in order to avoid going through all these objections one by one and taking a long time to prove them all untrue, let's hypothesize that what we have said is correct and carry on—with the understanding that if it should ever be shown to be incorrect, all the consequences we have drawn from it will be lost" (*Rep.* IV 436c6–437a8).  
**To respond to logico-linguistic (*logikos*) difficulties:** See Z4 1029<sup>b</sup>13n.

#### Note 388

**It is impossible for anyone to take the same thing to be and not to be, as some people think Heraclitus says:** Compare K5 1062<sup>a</sup>31–35. Those attributing the view to Heraclitus may have had in mind DK B10, 60, 61, 67, 88, 111 = TEGP 69 F40, 61 F38, 148 F103, 84 F54, 80 F50. If so, what Heraclitus believes is not (1) "I believe that A is F and A is not F," which would be a belief about his own beliefs, but (2) "A is F and A is not F," which is a belief about A. What the argument will try to show is that if Heraclitus (or anyone) sincerely utters (2), he cannot in doing so report his belief in its content. The reason is given in the next sentences.

#### Note 389

**If what is contrary to a belief is the belief in its contradictory (*antiphasēōs*):** "The belief that the good is not good is a false belief about what belongs to it intrinsically, whereas the belief that it is bad is a false belief about what belongs to it coincidentally, so that the more false belief about the good would be that in the contradictory [the good is not good] rather than that in the contrary [the good is bad]. But it is the person who holds the contrary belief who is most deceived about each thing. For contraries are among the things that differ the most about the same thing. So if one of these beliefs is in a contrary, and the belief in the contradictory is more contrary, clearly this will be the contrary one. The belief that the good is bad is complex, since the same person must presumably also suppose that it is not good" (*Int.* 14 23<sup>b</sup>18–27). "Affirmation" and "denial" are *kataphasis* (or *phasis*) and *antiphasis*. If X affirms that A is B and Y denies that A is B (by affirming A is not B), then what Y affirms is the contradictory (again, *antiphasis*) of what A affirms.  
**Then it is evident that it is impossible for the same person at the same time to take the same thing to be and not to be:** The denial of "A is B" is "A is not B." So the contrary of the attribute (1) *believes A to be B* is (2) *believes A to be not B*. Thus what should be impossible is for X to have both (1) and (2). But if, for example, "A" refers to the same thing as "C," but X is unaware of this, it seems not to be impossible for him to have both beliefs, since he can apparently

have the attribute (1) and the attribute (3) *believes C to be not B*, which is arguably identical to the attribute (2). Aristotle may require, however, that “the same thing” that X believes to be and not to be must be expressed in the same words or terms and not merely in synonymous or co-referential ones (Γ 5 1009<sup>a</sup>20–22).

#### Note 390

**PNC is by nature the starting-point of all the other axioms too:** The idea is perhaps this. Take some other axiom—for example, that proportionals alternate, so that (1)  $A : B :: C : D (= P) \supset A : C :: B : D (= Q)$ . Suppose X asserts that (1) does not hold, so that he accepts that (2)  $\Diamond(P \ \& \ \text{not } Q)$ . However, (3)  $\text{not } Q \supset \text{not } P$ . So (3)  $\Diamond(P \ \& \ \text{not } Q) \supset \Diamond(P \ \& \ \text{not } P)$  violates PNC. But (4)  $\Diamond(P \ \& \ \text{not } P)$  violates PNC. So in asserting that (1) does not hold X is violating PNC. Hence he cannot believe (1), though he may think he does, since he cannot disbelieve PNC. In the relevant sense, then, PNC is a starting-point of the axiom that proportionals alternate, and similarly of other axioms, since someone who denies it will be led back to PNC as something he cannot not believe.

#### Note 391

**Many even of those concerned with nature make use of this claim:** For example, Anaxagoras and Democritus (Γ 5 1009<sup>a</sup>27–30, <sup>b</sup>11, 15), Empedocles (1009<sup>b</sup>15–25), the Heracliteans (1010<sup>a</sup>7–15), Heraclitus (7 1012<sup>a</sup>24–25, 34–<sup>b</sup>2).

#### Note 392

**We have just taken it to be impossible for anything at the same time to be and not to be, and by means of this we have shown that it is the most stable of all starting-points:** At Γ 3 1005<sup>b</sup>18–32.

#### Note 393

**Now some people do demand that we demonstrate even this [PNC], but this is due to lack of educatedness:** See Γ 3 1005<sup>b</sup>2–5, α 3 995<sup>b</sup>6–16.

#### Note 394

**There is, however, a demonstration by refutation (*elegtikôs*) even that this view [the denial of PNC] is impossible:** “A refutation is a denial of one and the same thing—[1] not of the name but of the fact (*mê onomatôs alla pragmatôs*), and [2] not of a name (*onomatôs*) that is synonymous but the same” (SE 5 167<sup>a</sup>23–25). Here [1] is intended to exclude a case in which what we mean by—for example—“human” is what the disputant means by “not human” (1006<sup>b</sup>18–22: notice *mê einai* . . . *to onoma, alla to pragma*). [2], on the other hand, is an acknowledgment of the fact that the disputant must use some name, if indeed he is to engage in argument (1006<sup>a</sup>18–31). What [2] requires is that the name used should be the same as the one used in the refutation (and not a synonym of it), since one way to beg the question against a disputant is to postulate the very point at issue, which “is more apt to escape detection in cases of synonyms and in cases where a name and an account signify the same thing” (Top. VIII 13 162<sup>b</sup>36–163<sup>a</sup>1).

**If only the disputant says something (*ti legê[if]*):** Or “speaks of something.”

## Note 395

**The starting-point for all such arguments is . . . to ask the disputant . . . to signify something both to himself and to another person:** Compare K 5 1062<sup>a</sup>5–11, where it is claimed that asking the disputant to signify something is asking him for something equivalent to PNC that does not seem so to him.

## Note 396

**Anyone who agrees to this has agreed that something is true without a demonstration, so that not everything will be so-and-so and not so-and-so:** “This” refers to what the disputant agrees to, namely, to signify something to himself and others (K 5 1062<sup>a</sup>17–18). What is true without demonstration, then, may be this: that whatever name *N* the disputant uses in the argument signifies *A* for him and does not also signify not-*A* for him. The result being that the denial of PNC, which says that every predicate is always possessed along with its contrary, is false. For now there is at least one predicate, “signifies *X* for the disputant” that is not always possessed along with its contrary. Alternatively, what is true without demonstration may be that whatever the disputant applies *N* to is *A* and not also not-*A* for him (as 1006<sup>a</sup>29–30 perhaps suggests).

## Note 397

**A1:** Compare K 5 1062<sup>a</sup>16–20 ( $\equiv [A_1]$ ).

**The name [agreed to signify something by the disputant] signifies is or is not this** (*to einai ê to mê einai toti*): The “this” in question is the thing the name signifies, as “human” signifies “two-footed animal.” At  $\Gamma$  7 1012<sup>a</sup>23–24 it is identified as an account and a definition. What brings “is or is not” into the picture is what happens when the disputant applies the name to some thing *A*, or predicates the name of it. Since in so doing he takes *A* to be human (to fit the definition of human), and so runs the risk of falsehood if *A* turns out *not to be* human. Thus even “goat-stag” signifies something (*ti*) but not, as yet, anything false or true—unless ‘is’ or ‘is not’ (*to einai ê mê einai*) is added” (*Int.* 1 16<sup>a</sup>16–18). Nonetheless, to have signification a name must apply to something. Thus if we define “cloak” as “horse and human,” then to say [1] “A cloak is white” is no different from saying [2] “A horse is white and a human is white.” Hence if “[2] signifies more than one thing and is more than one affirmation, clearly [1] also signifies either more than one thing or nothing (since no human is a horse)” (*Int.* 8 18<sup>a</sup>23–26).

## Note 398

**A2a:** Compare K 4 1062<sup>a</sup>20–23 ( $\equiv [A_2]$ ).

**If “the human” signifies:** See A 9 991<sup>a</sup>1n.

**If “the human” signifies one thing:** “The human,” in one of its senses, applies to particular humans, which are substances possessed of essences (*Z.* 10 1035<sup>a</sup>1–3). Yet “white” also signifies “one thing (*hen*)” (*Int.* 8 18<sup>a</sup>17), namely, one quality, and qualities too have essences (*Z.* 4 1030<sup>a</sup>17–24), albeit in a derivative way (5 1031<sup>a</sup>7–14). In fact, even “not-human,” though not a name properly speaking, is yet an “indefinite name,” since “what it signifies is in a way one thing, but indefinite” (*Int.* 10

2 16<sup>a</sup>29–31). It is not clear, therefore, that the choice of “the human” as an example is intended to restrict the argument to terms that apply to substances.

Note 399

**I mean by “signifying one thing” that if human is this, then insofar as anything is human, this will be the being for human** (*to anthrôpô[i] einai*): The being for A = what A is intrinsically = the essence of A (Z 4 1029<sup>b</sup>13–1030<sup>b</sup>13, Iota 1 1052<sup>b</sup>3).

Note 400

**If, however, he . . . said that “the human” signified an unlimited number of things, it is evident that no argument would be possible [with him]:** Because the argument (demonstration by refutation) would have to have an unlimited number of premises, corresponding to each of the unlimited number of things “the human” signified for the disputant. See, for example, α 2 994<sup>b</sup>27–31.

Note 401

**Discussion** (*to dialegesthai*) **with others is done away with:** For the sense of *dialegesthai* see Γ 2 1004<sup>b</sup>20n.

Note 402

**It is not possible even to understand without understanding one thing:** See Iota 1 1052<sup>a</sup>29–34, also E 4 1027<sup>b</sup>23–25, Θ 10 1051<sup>b</sup>30–1052<sup>a</sup>4.

Note 403

**It is not, then, possible that “the being for human” should signify just what is not being for human, if “the human” signifies not only about one thing but also one thing:** If Socrates is musical, pale, and human, “the musical,” “the pale,” and “the human” can all signify *about* him—he can be the common referent of all three phrases—even though each of them signifies something different about him. In fact, if Socrates is pale at time *t*<sub>1</sub> but not pale at time *t*<sub>2</sub>, “the pale” and “the not-pale” can both signify about him.

Note 404

**All would be one, since they would be synonymous:** “Things are said to be *synonymous* when they have a name in common and when the account of the essence that corresponds to the name is the same” (*Cat.* 1 1<sup>a</sup>6–7). So, strictly speaking, different names signifying the same thing—which is the *polynumia* recognized at HA I 2 489<sup>a</sup>1–3—are not synonymous. In a weaker or less technical sense names are synonymous when—like “traveling” and “journeying”—“their prevailing (*kuria*) meanings are the same” (*Rh.* III 2 1405<sup>a</sup>1–2).

Note 405

**It has been shown, however, that they signify distinct things:** At 1006<sup>b</sup>11–18.

Note 406

**And in general those who say this do away with substance and the essence:** “Those who say this” are those who when asked, “Is it true to say that this thing is human or not?” reply “It is human and not human, pale and not pale, musical

and not musical.” They thus do away with, or fail to acknowledge the existence of a class of answers to the question that specify the thing’s substance or essence.

**It is necessary for them to say that all are coincidents and that there is no such thing as just the being for human** (*to hoper anthrôpô[i] einai*) **or just the being for animal**: “Things that signify substances signify—about what they are predicated of—just what that thing is or just what sort it is. Things that do not signify substances but are said of some other underlying subject, which is neither just what that thing is nor just what sort it is, are coincidents—for example, to say of the man [that he is] the pale. For the man is neither just [what] pale [is] (*hoper leukon*) nor just [what] sort pale [is], but instead, presumably, an animal, since an animal is just what the man is. Things that do not signify substances must be predicated of some underlying subject, and there cannot be anything pale that is pale not in virtue of being some other thing” (*APo.* I 22 83<sup>a</sup>24–32). On the sense of *hoper*, see  $\Gamma$  2 1003<sup>b</sup>33n.

#### Note 407

**And yet these are its denials**: Hence they should be true of it if PNC is false.

#### Note 408

**The pale** (*to leukon*) **is musical and the latter is pale, because both coincide with the human**: *To leukon* is probably not the universal *pallor*, but *to ti leukon*, a particular instance of pale, whose presence in a particular substance, A, makes it true that it coincides with A and that A is coincidentally pale (*Cat.* 2 1<sup>a</sup>27–28). Similarly, *to mousikon*, implicitly referred to here and explicitly at 1007<sup>b</sup>11, is probably *to ti mousikon*—compare *hê tis grammatikê* at *Cat.* 2 1<sup>a</sup>25–26, <sup>b</sup>8.

#### Note 409

**No one thing comes about from all of them**: “Of things predicated, and the things they get predicated of, those that are said coincidentally of things, either of the same thing or of each other, will not be one thing. For example, a human is pale and musical, but the pale and the musical are not one thing. In fact, they are both coincident with the same thing. And even if it is true to say that the pale is musical, the musical pale [thing] will still not be one thing” (*Int.* 11 21<sup>a</sup>7–14).

#### Note 410

**A3a**: Compare K 5 1062<sup>a</sup>23–30 (= [A<sub>3a</sub>]).

#### Note 411

**The argument of Protagoras**: See  $\Gamma$  5 1009<sup>a</sup>6–16.

#### Note 412

**The view of Anaxagoras, that all things were together**: DK 59 B1 = TEGP 11 F1. Also quoted and discussed at Iota 6 1056<sup>b</sup>28–30, A 2 1069<sup>b</sup>21.

#### Note 413

**It is potential being but not actual being that is indefinite**: Actual being and potential being are discussed in  $\Theta$ . On potentiality, see B 6 1003<sup>a</sup>1n.

## Note 414

**A3b:** Compare K 5 1062<sup>a</sup>36–<sup>b</sup>7 (= [A<sub>3b</sub>]).

## Note 415

**But if one is composed of the former two, it will also be opposed by one:** The former two are “a human” and “not a human,” which can form one conjunctive predicate “a human and not a human,” whose denial is the conjunction of the denials of each of its components, namely, “not a human and not (not a human),” which is equivalent to “neither a human nor not a human.”

## Note 416

**Why does someone walk to Megara instead of staying where he is, when he thinks he should walk there?:** Compare K 6 1063<sup>a</sup>28–35.

## Note 417

**Why does he not early one morning march straight into a well or into a ravine:** See Γ 5 1010<sup>b</sup>8–11.

## Note 418

**Someone who has beliefs** (*ho doxazôn*): *Doxa* can be about pretty much anything, including in particular things that admit of being otherwise (Z 15 1039<sup>b</sup>34). But *doxa* are unlike beliefs in that they presuppose rational calculation: “Perceptual appearance . . . the other animals have too, but the deliberative sort exists in those with rational calculation. . . . And that is the cause of their not seeming to have *doxa*, since they do not have the sort [of appearance] that results from deduction” (DA III 11 434<sup>a</sup>5–11). The *doxastikon*, which is the part of the soul responsible for *doxa*, is thus the same as the part that rationally calculates (NE VI 5 1140<sup>b</sup>25–26, 13 1144<sup>b</sup>14–15). But unlike rational calculation, which is a type of inquiry, *doxa* are things “already determined,” since they are “not inquiry but already a sort of assertion” (9 1142<sup>b</sup>11–14).

**When compared to someone who has scientific knowledge** (*ton epistamenon*), **is not in a healthy condition in relation to truth:** The unhealthy condition of the *doxazôn* in relation to the *epistamenos* could lie in (1) what each of them asserts, or (2) in the rational calculation or deduction on the basis of which they assert it. But since (1) is based on (2) in both cases, it seems that it must lie in (2). Scientific knowledge of X involves knowing the cause of X (α 1 993<sup>b</sup>23–24), whereas the rational calculation on which belief in X is based need not provide such knowledge.

## Note 419

**The argument of Protagoras:** “Protagoras says, you know, that ‘Man is the measure of all things, of those that are that they are and of those that are not that they are not’” (Plato, *Tht.* 152a2–4). Compare K 6 1062<sup>b</sup>12–24.

## Note 420

**All the appearances** (*ta phainomena*): See A 5 986<sup>b</sup>31n.

Note 421

**The same way of inquiry should not be used in response to all the disputants we encounter:** Compare  $\Gamma$  6 1011<sup>a</sup>3–16.

**Some need persuasion** (*peithous*), **others force** (*bias*): “Induction is more convincing, more perspicuous, more knowable by perception, and common to the majority of people, whereas deduction has greater force (*biastikôteron*) and is more effective against those skilled in logico-linguistic disputation (*antilogikous*)” (*Top.* I 12 105<sup>a</sup>16–19).

Note 422

**As Anaxagoras says, “everything is mixed in everything,” and also Democritus:** See A 4 985<sup>b</sup>5n, 8 989<sup>a</sup>30n.

Note 423

**We shall require them to take it that among the beings there is also another sort of substance to which neither movement nor passing away nor coming to be at all belongs:** See 1010<sup>a</sup>25–35, A 6.

Note 424

**Some have come to believe in the truth of appearances on the basis of perceptibles:** Compare K 6 1063<sup>a</sup>35–<sup>b</sup>7.

Note 425

**They take perception to be thought** (*phronêsin*): *Phronêsis* here means not “practical wisdom” but something more general, such as “thought” or “knowledge” (A 1 980<sup>b</sup>1n), and is used presumably because it shares a root with *paraphronein* (“out of their minds”). The view that perception is thought is the epistemic correlative of the view that there are no beings beyond the perceptible ones.

**And take it to be an alteration** (*alloiôsin*): Aristotle does not tell us how this view figures in the argument against PNC or for Protagorean relativism and Heracliteanism. Perhaps the thought is this: (1) Causing a certain sort of alteration in X’s body causes X to be appeared to as by an A. (2) Therefore, since perception is that sort of alteration, X perceives an A. (3) But perception is (veridical) thinking or knowing. (4) Therefore, X (veridically) thinks or knows that the thing he perceives is an A. But whether or not that is the argument he has in mind, Aristotle himself rejects the view that perception is an alteration: “Both of the first two, then, [namely, the one who can acquire scientific knowledge and the one who has it but is not now actively exercising it], being scientific knowers potentially, come to be scientific knowers actively—but the one by being altered (*alloiôtheis*) through learning and by frequent changes (*metabálôn*) from the contrary state, and the other, by passing in another way from the state of having scientific knowledge of arithmetic or grammar, but not activating it, to activating it. And being affected is not simple, either. On the contrary, it is on the one hand a sort of destruction of something by its contrary, while on the other it is the preservation of what is so potentially by what is so actually, and is like it in the way that a potentiality may be like an actuality. For what possesses scientific knowledge becomes an actual contemplator (*theôroun*), and this is not an alteration (*alloiousthai*), since the progress



of the thing is into itself or into actuality, or else is a distinct kind (*genos*) of alteration . . . one a change to conditions of lack, the other to the states and the nature [of the thing]" (DA II 5 417<sup>a</sup>30–<sup>b</sup>16); "It is evident that the perceptible object makes what potentially perceives into what actually perceives. For it is not affected or altered (*alloioutai*). That is why this is a distinct kind (*eidos*) from movement. For movement is an activation of what is incomplete, whereas unconditional activity is distinct, namely, the activation of what is complete. Perceiving, then, is like bare announcing or contemplating" (III 7 431<sup>a</sup>4–8). Alteration is focally discussed in *Ph.* VII 3.

Note 426

**Empedocles:** DK B106 = TEGP 164 F116, DK B108 = TEGP 166 F118. Aristotle quotes the same two passages in *DA* III 3 427<sup>a</sup>22–25.

Note 427

**Parmenides:** DK B16 = TEGP 51 F17.

Note 428

**Homer:** *Iliad* XXIII.698. The lines refer to Eurylaus not Hector.

Note 429

**In these there is much of the nature of the indefinite—that is, of the sort of being we described:** See 1009<sup>a</sup>32–36.

Note 430

**It is more fitting to put the matter like that than as Epicharmus put it against Xenophanes:** Epicharmus, active during the first quarter of the 5th cent BC, was a writer of comedies from Sicily. In Plato, *Tht.* he is characterized along with Homer and "all the wise men of the past, with the exception of Parmenides," as making "all things the offspring of flux and movement" (152e1–9). Aristotle mentions him at *Po.* 3 1448<sup>a</sup>32. It is not clear what he said about Xenophanes (on whom see A 5 986<sup>b</sup>21–27).

Note 431

**This was the sort held by Cratylus:** See A 6 987<sup>a</sup>32n.

**[Cratylus] criticized Heraclitus for saying that it is not possible to step into the same river twice:** DK B91 = TEGP 66.

Note 432

**What is losing something has some of what is being lost, and of what is coming to be, something must already be:** "Nor as regards change to a denial (*antiphasei metabolén*) is there anything impossible for us to deal with—for example, if a thing is changing from not white to white, it might be supposed that it will be neither white nor not white. For if it is not wholly in either condition, nothing prevents us from calling it white or not white. For we say that something is white or not white not just when it is wholly one or the other, but when most of its parts or the most controlling parts are: not to be in a condition is not the same as not to be wholly in it. Similarly in the case of being and not being and the other pairs of contradictories, since the

changing thing will necessarily be in one or other of the opposed conditions, but never wholly in either" (*Ph.* VI 9 240<sup>a</sup>19–29).

Note 433

**It is not the same thing to change in quantity and to change in quality** (*kata to poion*): Compare K 6 1063<sup>a</sup>22–28 and, for the relevant sense of *to poion*, see Δ 14 1020<sup>a</sup>33–<sup>b</sup>1.

Note 434

**Those who took this to be so could fairly be criticized for asserting about the whole of the heaven what they saw only in a minority even of perceptibles:** Compare K 6 1063<sup>a</sup>10–17.

**The whole of the heaven:** That is, the universe (A 5 986<sup>a</sup>3n, A 1 1069<sup>a</sup>19n).

Note 435

**What we said before:** At 1009<sup>a</sup>36–38.

Note 436

**To say that things at the same time are and are not** (*einai kai mê einai*) **is to imply that that all of them are at rest rather than that they are moving, since there is nothing for things to change into, since everything belongs to everything:** Compare K 6 1063<sup>a</sup>17–21.

Note 437

**Even if perception, at any rate of a special object, is not false:** “By a special perceptible I mean the one that cannot be perceived by another perceptual capacity and about which we cannot be in error. . . . Each perceptual capacity is discerning about its special objects, at any rate, and does not make errors about whether there is color or whether there is sound but about what the colored thing is or where it is, or what the thing making the sound is or where it is” (*DA* II 6 418<sup>a</sup>11–16). This inerrancy (in which its control lies) presupposes, however, that the perceptual capacities are functioning properly in conditions which do not impede such functioning. For people “do not perceive what is presented to their eyes, if they happen to be deep in thought, or afraid, or hearing a lot of noise” (*Sens.* 7 447<sup>a</sup>15–17), and cannot perceive accurately what is not presented at the right distance (449<sup>a</sup>21–24) or in the right way: “each thing is more readily perceptible when presented simply by itself (*haplôs*) than when mixed with others—for example, pure rather than un-mixed wine, or honey, or a color, or a single rather than one in a chord—because they tend to obscure each other” (447<sup>a</sup>17–20).

**Imagination is not the same thing as perception:** “Imagination is a movement that takes place as a result of the activation of perception . . . , and because its objects [= appearances] persist and are similar to perceptions, animals act largely in accord with them, some, such as beasts, because they lack understanding, and others, such as humans, because their understanding is sometimes obscured by feeling, disease, or sleep” (*DA* III 3 429<sup>a</sup>1–8; also 8 432<sup>a</sup>9–10, 10 433<sup>a</sup>9–10). The final clause indicates some of the factors that make imagination less reliable than perception, especially where special objects are concerned.

## Note 438

As Plato too says: *Tht.* 171e, 178b–179a.

## Note 439

Among perceptual capacities themselves there is not the same degree of control [1] in the case of the object of a perceptual capacity other than itself and that of a special object, nor [2] in that of a neighboring object as in its own: In [1] the contrast is between a case in which sight discerns the red of something (red being a special perceptible) with a case in which it discerns the heat of something (heat being a special object of touch) from its color. In such a case, where color and temperature are quite different qualities, sight is a much more reliable discerner of color than of temperature. But even when, as in [2], the qualities are neighboring or analogous, a sense discerns its own special objects more reliably than it does neighboring ones, such as odors and flavors, where “odors as well as tastes are pungent, sweet, harsh, astringent, and oily, and we might regard fetid odors as analogous to bitter tastes” (*Sens.* 5 443<sup>b</sup>9–11).

## Note 440

What is necessary cannot possibly be in one state and another (*allôs kai allôs*): See  $\Delta$  5 1015<sup>b</sup>11–14 and notice *allôs kai allôs* at 1015<sup>b</sup>13.

## Note 441

That neither objects of perception (*ta aisthêta*) nor perceptions (*ta aisthêmata*) would exist is presumably true . . . but that the underlying subjects that produce perception would not exist even without perception is impossible: “The early physicists did not put things well in thinking that there is nothing white nor black without sight, or any flavor without taste. For in one way they put things correctly but in another incorrectly. For since perception (*tês aisthêseôs*) and the object of perception (*tau aisthêtou*) are said in two ways, as potential and as actual, what they said holds of the latter, but does not hold of the former” (*DA* III 2 426<sup>a</sup>20–25). What Aristotle is claiming here, then, is that neither perceptible properties, such as white, sweet, or hot, nor perceptions of them would actually exist without animate beings. The “underlying subjects” that would exist even without such beings are the things that have these properties in their dispositional or potential form.

Since this is an affection (*pathos*) of the perceiver: “If, then, movement—that is, acting (*poiêsis*) and being affected—is in what is being acted upon, both sound and hearing must actually be in what is hearing potentially. For the actualization of what can act and can produce movement takes place in what is affected, which is why it is not necessary for the mover to be itself moved” (*DA* III 2 426<sup>a</sup>2–5; also  $\Theta$  8 1050<sup>a</sup>30–32). On the meaning of *pathos*, see A 2 982<sup>b</sup>16n.

## Note 442

Perception is certainly not perception of itself, but there is also some other thing beyond the perception, which is necessarily prior to the perception: “If one must say what each of them is, for example, what the capacity to understand is, or to perceive, or to be nourished, we must first say what understanding and perceiving are, since activities and actions are prior to capacities in

account. And if this is so, and if again, prior to them, we should have considered their correlative objects, then we should for the same reason determine them first, for example, food, perceptibles, and intelligible objects" (DA II 4 415<sup>a</sup>16–22).

Note 443

**What moves something is prior in nature to what is moved:** A is prior in nature to B if A can be without B, but not B without A (Δ 11 1019<sup>a</sup>3–4).

**Even if they are said to be with reference to each other, this is no less so:** See Δ 15 1021<sup>a</sup>29–33n.

Note 444

**Among those who are persuaded by all this and among those who merely state these arguments:** Compare Γ 5 1009<sup>a</sup>18–22, K 6 1063<sup>b</sup>7–16.

Note 445

**They are inquiring about who will discern the person of sound mind** (*ton ugiainonta*): *Huglainein* often means "to be healthy," but here probably has its other common connotation, "being of sound mind." This is what makes these inquirers relevantly similar to those puzzled about how we tell whether we are asleep now or awake.

Note 446

**Just as we said, this is how they are affected:** At Γ 4 1006<sup>a</sup>5–11.

Note 447

**The starting-point of demonstration is not a demonstration:** See A 9 992<sup>b</sup>31n, B 2 997<sup>a</sup>8n.

Note 448

**They demand to state things contrary, and at once are stating contrary things** (*enantia gar eipein axiousin, euthus enantia legontes*): The people in question are looking for a demonstration that will force them to abandon their views. Until they get it, they demand to assert those views, which are "things contrary," because they are the contraries of things like "we are awake now," or "we are of sound mind now." As a result, they are "at once stating contrary things." For the things they demand to assert are the contraries of the starting-points of the demonstrations they are demanding. It is also possible, however, to understand the sentence as focused more narrowly on PNC alone: "they demand that we refute them by stating things contrary to what they say, but then they at once state contrary things themselves." The idea, then, is that to ask to be convinced of the contrary of something, while at the same time allowing that contraries can be true by stating them ourselves, is to look for the impossible.

Note 449

**If a thing is one, it is one relative to one thing or to something definite:** "All things are said to be relatives in relation to correlatives that reciprocate. For example, the slave is said to be 'slave of a master' and the master is said to be 'master

of a slave'; the double 'double of the half' and the half 'half of a double'; the larger 'larger than a smaller' and the smaller 'smaller than a larger'; and so on for the rest as well" (*Cat.* 7 7<sup>28</sup>–33).

**If the same thing is both half and equal, still it is not to the double, at any rate, that the equal is relative:** If A is half and equal, and it is relative to B that it is half, so that  $B = 2 \times A$ , it is not relative to B ("the double") that A is equal, but relative to something else, namely, to something that A is in fact equal to.

#### Note 450

**If, then, relative to a believer the same thing is human and the object of belief, it is not the believer who will be human but the object of belief:** If to be human is simply to be believed to be human by some believer, to be human will not be to be a believer, but to be an object of some believer's belief. But this is absurd—especially if, as Protagoras claims, it is to human beliefs in particular that all things are relative.

#### Note 451

**If each thing is to be relative to a believer, a believer will be relative to things that are unlimited in kind:** For X to be a believer is for him to believe something, such as, that A is human, which is a specific kind,  $K_1$ , of thing. But for A to be of  $K_1$  is for A to be believed to be of  $K_1$  by some believer or believers. So when X believes that A is of  $K_1$  what he believes is that A is of  $K_1$  relative to some believer or believers, since that is just what it is for A to be of  $K_1$ . But being of  $K_1$  relative to  $X_1$  is different from being of  $K_1$  relative to  $X_2$ , and so on. So what X believes when he believes that A is of kind  $K_1$  is like what Y believes when he believes that A is double, but not double of anything specific, which is sufficiently indefinite as to be without content.

#### Note 452

**One of a pair of contraries is a lack no less [than a contrary], . . . and a lack is the denial [of a predicate] to some definite kind:** See  $\Gamma$  2 1004<sup>29</sup>–20n.

**Or a lack of substance:** A lack can be the lack of one of a pair of contraries, but it can also be the lack of something that strictly speaking has no contrary, such as substance or form: "It also belongs to substances that there is nothing contrary to them. For what could be contrary to a primary substance? For example, there is nothing contrary to a particular human [a primary substance], nor yet is there anything contrary to human or animal" (*Cat.* 5 3<sup>24</sup>–27). Lack of substance or form is evidenced in cases of existence changes, where a substance either comes to be or passes away. See *Iota* 4 1055<sup>11</sup>–29.

#### Note 453

**But then neither is it possible for there to be anything in the middle between contradictories:** Compare *K* 6 1063<sup>19</sup>–24.

#### Note 454

**It is said that neither what is nor what is not either is not or is not:** By those who deny PEM.

Note 455

**This is clear from the definition:** That is, from the definition of truth and falsehood given at 1011<sup>b</sup>26–28 and again at 1012<sup>a</sup>4–5.

Note 456

**Whenever it combines things this way in an affirmation or denial, it says what is true, whenever this other way, it says what is false:** See A 1 981<sup>a</sup>6n.

Note 457

**There must be a middle between all contradictories** (*para pasas tas antiphasais*): *Para* (with the accusative) here has the narrower implication of being beyond the contradictories by being between them. The examples that follow are cases where it is taken to be clear that no middle exists.

**If it [the denial of PEM] is not being stated for the sake of argument:** A denier of PEM who tries to restrict its scope will be open to an analogue of  $\Gamma$  4 1008<sup>a</sup>7–34 (= [A4]).

Note 458

**There will also be a sort of change between coming to be and passing away:** That is, there would be another sort of substantial or existence change between coming to exist and ceasing to exist, which is impossible.

Note 459

**In those kinds in which the denial implies the contrary, even in those there will be a middle:** “If contraries are such that it is necessary for one or other of them to belong to the things they naturally occur in or are predicated of, there is nothing in the middle of them. For example, sickness and health naturally occur in animals’ bodies, and it is indeed necessary for one or the other to belong to an animal’s body, either ‘sickness’ or ‘health.’ Again, ‘odd’ and ‘even’ are predicated of numbers, and it is indeed necessary for one or the other to belong to a number, either ‘odd’ or ‘even.’ And in the middle of these there is certainly nothing, neither between ‘sickness’ and ‘health’ nor between ‘odd’ and ‘even.’ But if it is not necessary for one or the other to belong, then there is something in the middle of them—for example, black and white naturally occur in bodies, and it is certainly not necessary for one or other of them to belong to a body, since not every body is either white or black” (*Cat.* 10 11<sup>b</sup>38–12<sup>a</sup>13). The argument is that while all contraries entail correlative kinds ( $\Gamma$  2 1004<sup>a</sup>9–20) and many contraries are such that within the entailed kinds, the denial that one belongs does not entail that the other belongs ( $A$  is not- $B \nrightarrow A$  is  $B$ , and  $A$  is not not- $B \nrightarrow A$  is  $B$ ) there are contraries and kinds where this entailment does hold. In some of the previous arguments this is taken to be an observable fact.

**As is clear from the definition:** The same phrase is used at 1012<sup>a</sup>3 to refer to the definition of truth and falsehood at 1011<sup>b</sup>26–28 and 1012<sup>a</sup>4–5. It can hardly have a different reference here. What is clear from the definition is that to say of an odd (even) number that it is “odd” (“even”) is to speak the truth. Then, from the observed fact that “odd” and “even” are contraries which, within the entailed kind number, are such that the denial of one entails that the other belongs, it is concluded that no number can be neither odd nor even.

## Note 460

**Further, the process will go on without limit, and the beings will be not half as many again but even more, since it will be possible to deny *this* in turn as regards its affirmation and denial, and this will be something:** “The argument is this: if there is something in the middle between contradictories, then the beings will be not only half as many again—as seems to be the case, since the middle is added to the affirmation and the denial as a third thing—but also the process would go on without limit. . . . For, if there is to be some middle nature, signified by the denial of each of the two, of the affirmation and of the denial, it is clear that it will be possible to affirm [and to deny] it, given that it is possible to affirm and to deny where all things are concerned, as has been shown in *De Interpretatione* [6]. But if it is possible to affirm and to deny *it*, then there will be in turn be something in the middle between these, something in the middle between the affirmation of this middle and the denial of it, [a second middle] of which the denial of both the affirmation and the denial [of the original middle] is true—given that there is a middle between every pair of contradictories—a middle that will, it is clear, itself be some nature, given that in its case the denial of these is true. But if there is some such thing, then in the case of this middle there will in turn be an affirmation and a denial and something else in the middle, [a third middle] of which the denial of each of these will be true; and this will go on without limit” (Alex. *In. Metaph.* 332.18–333.7 = Madigan, 128–129).

**Its substance [= essence] is something else:** “For what is signified by both [the affirmation and the denial] is different from what is signified by the affirmation or by the denial” (Alex. *In. Metaph.* 333.15–16 = Madigan, 129–130).

## Note 461

**Eristic arguments:** See Γ 2 1004<sup>b</sup>19n.

**Contradoxical (*paradoxôn*):** What is *paradoxos* is not what is paradoxical in our sense of the term but what is contrary to or goes against (*para*) our reputable beliefs (*endoxa*). Hence the neologism, “contradoxical.” It is typically sophists who try to “refute in a way that is contradoxical,” with the result that the conclusion of their argument, because it goes contrary to beliefs, including reputable beliefs (*endoxa*), constitutes a puzzle (*NE* VII 2 1146<sup>a</sup>21–24).

## Note 462

**Heracitus’ argument, which says that everything is and is not, makes everything true:** It also makes everything false, as Aristotle goes on to argue (Γ 8 1012<sup>a</sup>29–<sup>b</sup>2). **That of Anaxagoras, that there is something in the middle of contradictories, makes everything false:** Because to say of A that it is neither B nor not B is to say something false where A is B and where A is not B (1011<sup>b</sup>25–19).

## Note 463

**When things are mixed, the mixture is neither good nor not good, so that there is nothing true to say:** “Good” is a stand-in for any predicate. See K 6 1063<sup>b</sup>24–35.

## Note 464

**The commensurability of the diagonal:** See A 2 983<sup>a</sup>16n.

Note 465

**As was also said in the arguments given above:** See Γ 4 1006<sup>a</sup>18–22.

**We must base discussion (*dialekteon*) on a definition:** That is, on the definition signified by whatever name is granted to have some signification by the disputant in the argument. See Γ 7 1012<sup>a</sup>21–24.

**Discussion (*dialekteon*):** On the sense of *dialekteon* (*dialegesthai*), see Γ 2 1004<sup>b</sup>20n.

**Having taken for granted what “falsity” and “truth” signify:** See Γ 7 1011<sup>b</sup>25–29.

Note 466

**They do away with themselves:** Compare K 5 1062<sup>b</sup>7–11 (= {A<sub>3b</sub>}).

Note 467

**It is evident . . . is itself immovable:** This paragraph is omitted from some mss. and is bracketed for omission in OCT.

**There is something that always moves the things that are moving, and the prime mover is itself immovable:** See A 7.

Note 468

**The speaker himself at one time was not (*ouk ên*) and will not be (*ouk estai*) again:** This could be a claim about the speaker’s past and future non-existence. But this would make it dubiously relevant to the claim it is supposed to support, namely, that it is false that the same statements are always true and the same ones always false. It seems better, therefore, to understand it as saying that the speaker himself was at one time not speaking and will not be speaking again at a future time. His own making of statements thus becomes a refutation of his claim that all things are at rest. Compare *Ph.* VIII 3 254<sup>a</sup>24–30: “Even if it is truly the case that being is infinite and unchanging, it certainly does not appear to be so according to perception; rather, many beings appear to undergo change. Now if indeed there is such a thing as false belief or belief at all, there is also change; similarly if there is imagination, or if anything is thought to be one way at one time and another at another. For imagination and belief are thought to be changes of a sort.” It was perhaps a partial appreciation of this point that led Cratylus to give up speaking in favor of moving his finger (Γ 5 1010<sup>a</sup>12–13).

## BOOK DELTA (V)

Note 469

**Book Delta:** This book is a sort of lexicon of the different ways in which things are said to be N, where the things N applies to have already been identified as of interest to philosophy, as the science that gets a theoretical grasp on being qua being and the attributes that it has qua being (Γ 2 1004<sup>a</sup>31–<sup>b</sup>8, 1005<sup>a</sup>13–16). These include being, one, substance, and also plurality, lack, other, unlike, difference, and contrariety (1004<sup>a</sup>10–20) and completeness, prior and posterior, genus and species, whole and part and “others of that sort” (1005<sup>a</sup>11–18).



## Note 470

**Even in learning we must sometimes begin not from what is primary, that is, the starting-point of the thing, but from the point from which it is easiest to learn:** Compare Z 3 1029<sup>b</sup>3–12.

## Note 471

**Whereas of animals some take it that the heart does:** Aristotle himself belongs to this group. See GA II 1 735<sup>a</sup>12–26, 4 740<sup>a</sup>17–19.

**Some the brain:** See Plato, *Ti.* 44d.

## Note 472

**The rulers in cities, dynasties, and kingships are said to be *archai*:** *Archê* also means “ruler.”

**As are crafts, especially architectonic ones:** See Z 7 1032<sup>a</sup>32–<sup>b</sup>17, A 1 981<sup>a</sup>30n.

## Note 473

**The hypotheses are the starting-points of demonstrations:** A hypothesis here is a premise, which need not be hypothetical in status (B 2 997<sup>a</sup>6n).

## Note 474

**All causes are starting-points:** Sometimes “the starting-point is the first among the causes” (GC I 7 324<sup>a</sup>27–28). Γ 2 1003<sup>b</sup>22–25 states the more typical view.

## Note 475

**Nature (*phusis*):** See Δ 4.

**Element:** See Δ 3.

**Thought and deliberate choice (*prohairesis*):** “Thought by itself, however, moves nothing. But the one that is for the sake of something and practical does. Indeed, it even rules productive thought. For every producer produces for the sake of something, and what is unconditionally an end (as opposed to in relation to something and for something else) is not what is producible but what is doable in action. For doing well in action is the end, and the desire is for it. That is why deliberate choice is either desiderative understanding or thought-involving desire, and this sort of starting-point is a human” (NE VI 2 1139<sup>a</sup>35–<sup>b</sup>5).

**Substance:** Reading οὐσία with Ross for OCT ἡ οὐσία (“the substance”) with OCT. Substance is discussed in Δ 8.

**The for-the-sake-of-which:** See B 2 996<sup>b</sup>12n.

## Note 476

**The good and the noble (*kalon*):** On the difference between good and noble, see M 3 1078<sup>a</sup>31–32.

## Note 477

Δ 2: This chapter is almost word-for-word identical to *Ph.* II 3 194<sup>b</sup>23–195<sup>b</sup>21.

## Note 478

**The kinds (*genos*) of these:** Metal in the case of bronze and silver.

Note 479

**Some are instruments (*organa*) and others works:** Drugs are instruments; making thin and purging are works or actions.

**Works (*erga*):** *Ergon* is usually “function,” but here *erga* are the works done as a further end or result of exercising a function (B 2 996<sup>b</sup>7n).

Note 480

**There are many causes of the same thing, and not in coincidental way:** See Γ 1 1003<sup>a</sup>28n.

**Not in accord with its being another thing:** Equivalent in meaning to “not in a coincidental way.” Even when we are talking about a statue insofar as it is a statue, or insofar as it is what it intrinsically is, and not as the possessor of some coincident (such as being in a museum), it still has many causes.

Note 481

**Four most evident ways [of being causes] (*tropous*):** See *tropoi de tôn aitiôn* at 1013<sup>b</sup>29 and *tous tropous tôn aitiôn* at B 2 996<sup>b</sup>5–6. On the four ways themselves, see A 3 983<sup>a</sup>24–32, *APo.* II 11.

Note 482

**Phonetic elements (*stoicheia*) are causes of syllables:** Phonetic elements in spoken syllables = letters in written ones. See A 3 983<sup>b</sup>10n.

**Hypotheses:** See Δ 1 1013<sup>a</sup>16n.

Note 483

**The whole (*to holon*), the mode of constitution (*hê sunthesis*), and the form:** “The whole is the form that is over the parts, which function as matter, and the mode of constitution over the letters, for the syllable [has a form] of this sort” (*Alex. In. Metaph.* 351.32–33 = Dooley 5, 21). On *sunthesis*, see A 8 989<sup>b</sup>4n.

Note 484

**Let us assume that it makes no difference whether we say “good” or “apparent good”:** See Α 6 1072<sup>a</sup>27–28n.

Note 485

**Polyclitus:** Active c. 460–410 BC and admired by Socrates (*Xenophon, Memorabilia* I iv 3) and by Aristotle (*NE* VI 7 1141<sup>a</sup>10–11) for his wisdom. He advocated a system of proportion in which every part of the body was related mathematically to every other.

Note 486

**If the pale and the musical were said to be causes of the statue:** The pale and the musical (on which see Γ 4 1007<sup>b</sup>4n) are coincidents of the proper or intrinsic cause, which is Polyclitus or a human.

**But not Polyclitus or human only:** Reading ἀλλὰ μὴ μόνον Πολύκλειτος ἢ ἄνθρωπος, which is bracketed for deletion in the OCT and is not present in the mss. of the *Physics*.

**Only (*monon*):** That is, “without mention of any coincidents.”

## Note 487

**Beyond all the things said to be causes:** Retaining *παρά* (“beyond”), which OCT brackets for deletion.

## Note 488

**What things causes are causes of will also be said to be in the ways mentioned—for example, . . . this bronze, bronze, or in general matter:** “For the crafts produce the matter, some unconditionally while others make it serviceable. . . . Indeed, there are two crafts which rule over the matter and have knowledge of it, the craft concerned with the use of it and the architectonic one that produces it. That is why the one concerned with the use of it is also in a way architectonic, but as architectonic it differs from the other insofar as it knows the form, whereas the one concerned with production knows the matter. For the captain knows what sort of form the rudder should have and prescribes its production, whereas the other knows what sort of wood it should be made from and by what movements it will be made” (*Ph.* II 2 194<sup>a</sup>33–<sup>b</sup>7).

## Note 489

**What is actual and what is particular (*ta kath’ hekaston*) exists, or does not exist, at the same time as the things it causes:** At the same time as doctor X is actually or actively making patient Y healthy, or builder Z is actually or actively building house W, Y is being made healthy and W is being built. If X stops making healthy or Z stops building, Y stops being made healthy and W stops being built.

## Note 490

**The elements of a voiced sound:** See B 3 998<sup>a</sup>25n.

## Note 491

**Things are said to be elements of diagrams and, in general, of demonstrations:** B 3 998<sup>a</sup>27n.

## Note 492

**Of this sort are the primary deductions (*sullogismoi hoi prôtai*) consisting of three terms proceeding through one middle:** The contrast, apparently, is between [1] primary deductions and deductions where “the conclusion is reached either by [2] prior deductions (*prosyllogismôn*) or [3] through several continuous middle terms—for example, AB through C and D” (*APr.* I 24 42<sup>b</sup>5–6). In [2] the primary deductions are the prior ones, and in [3] they are deductions each of which uses only one of the several continuous terms. Another pertinent contrast is with enthymemes: “An enthymematic deduction must consist of few premises, fewer often than those of which the primary deduction (*ho protos sullogismos*) consists” (*Rh.* I 2 1357<sup>a</sup>16–17).

## Note 493

**Since, then, the so-called genera are universal and indivisible (for there is no account of them):** The so-called genera must be ultimate ones, which, because

they cannot be analyzed into genus and differentia, are indivisible and have no account or definition. See  $\Delta$  6 1016<sup>b</sup>33–34.

Note 494

$\Delta$  4: The contents of this chapter correspond to those of *Ph.* II 1 as follows: 1014<sup>b</sup>16–17 = 193<sup>b</sup>12–18; 18–20 = 192<sup>b</sup>8–193<sup>a</sup>2; 26–32 = 193<sup>a</sup>9–17; 32–35 = 193<sup>a</sup>17–30; 35–1015<sup>a</sup>5 = 193<sup>a</sup>30–<sup>b</sup>12. Nothing corresponds to 1014<sup>b</sup>17–18, 20–26, 1015<sup>a</sup>6–19.

Note 495

**Nature** (*phusis*) is, in one way, the coming to be of things that grow, as if we were to pronounce the *u* long: *Phuesethai* (“to grow”) has a long *u* in most of its forms.

Note 496

**That from which the first movement in each of the beings that are by nature is present in it insofar as it is itself** (*auto[i] hê[i] auto*): “Nature is a sort of starting-point and cause of moving and resting in what it is present in primarily and intrinsically (*kath’ hautō*) and not coincidentally. I say ‘not coincidentally’ because (for example) someone who is a doctor might come to be a cause of health to himself. Nonetheless, it is not insofar as he is made healthy that he possesses the craft of medicine but rather being a doctor and being made healthy are coincident in the same person. That is why they can be separated from one another” (*Ph.* II 1 192<sup>b</sup>20–27). A doctor treats himself coincidentally, but nature is an intrinsic cause of movement in itself, and so is like an intrinsically self-treating doctor (8 199<sup>b</sup>30–32).

Note 497

**In the case of things that grow together there is some one thing, the same in both, which makes them grow together** (*sumphukenai*) instead of [merely] making contact: See K 12 1069<sup>a</sup>5–12.

Note 498

**Something is from these when the primary matter** (*prôtês hulês*) **is preserved throughout**: The primary matter is not featureless matter (Z 3 1029<sup>a</sup>20–21n), but the matter from which the thing is made when it first comes into existence, such as bronze in the case of a statue that is initially made of bronze (*Ph.* II 1 193<sup>a</sup>10–28,  $\Delta$  24 1023<sup>a</sup>27–29). This is the nature of the thing provided the matter “cannot be changed from the capacity that belongs to it” throughout the existence of that thing. Thus bronze is the nature of the statue provided the matter of the statue continues to have the capacity that makes it bronze.

Note 499

**Empedocles says**: DK B8 = TEGP 32 F11.

Note 500

**What exists by nature, then, is what is composed of both of these**: That is, of both form (or shape) and matter.

## Note 501

**As Evenus says:** Evenus of Paros (5th cent BC) is described as a poet (Plato, *Phd.* 60c8–e1) and as an orator (*Phdr.* 267a1–5), a few fragments of his elegies survive. This line—F8 West—is also quoted at *EE* II 7 1223<sup>a</sup>32, *Rh.* I 11 1370<sup>a</sup>11.

**As Sophocles says:** *Electra*, 256.

## Note 502

**In accord with deliberate choice:** See  $\Delta$  1 1031<sup>a</sup>2n.

**And in accord with rational calculation:** See A 1 980<sup>b</sup>28n.

## Note 503

**Primary things:** See A 2 982<sup>a</sup>25–<sup>b</sup>7, Z 4 1030<sup>a</sup>10–11n.

## Note 504

**The necessary in the primary and full way is the simple:** See A 7 1072<sup>a</sup>21–<sup>b</sup>1.

**The simple (to haploun):** See A 3 983<sup>b</sup>14n.

## Note 505

**Or even to be both in one state and another** (*oude allôs kai allôs*): See  $\Gamma$  5 1010<sup>b</sup>30n.

## Note 506

**If there are certain things that are eternal and immovable, there is nothing forced or contrary nature in them:** See  $\Theta$  8 1050<sup>b</sup>24n.

## Note 507

**Coriscus:** Coriscus of Scepsis was a member of a school of Platonists with whom Aristotle was probably acquainted while at the court of Hermias in Assos (c. 347–344 BC). He is frequently used by Aristotle in examples, as at E 2 1026<sup>b</sup>18, Z 11 1037<sup>a</sup>7.

## Note 508

**The musical Coriscus is in a way one with Coriscus because one of the parts in the account** (*en tô[i] logô[i]*) **coincides with the other:** Aristotle is not always careful to distinguish linguistic items, such as accounts, definitions, or—as perhaps here—simply phrases or sentences, from their ontological correlates. For example, he speaks of Socrates as not separating “the definitions” from perceptibles, when it is the essences that are the ontological correlates of the definitions to which he is referring (M 4 1078<sup>b</sup>30–31), and of the account of X as composed of the matter and the activation (= form), when it is X itself—the ontological correlate of the account—that is so composed (H 6 1045<sup>a</sup>34–35).

## Note 509

**They do not both belong to him in the same way, but human presumably does so as genus and included in the substance** (*en tê[i] ousia[i]*), **whereas musical does so as a state or attribute of the substance** (*tês ousias*): Human (the genus or kind) is included in the substance of Coriscus, which is his essence. Musical, on the other hand, is a state or attribute of the substance that Coriscus is. See A 3 983<sup>a</sup>30n.

Note 510

**Of things said to be one intrinsically, some are said to be so because they are continuous** (*sunechê*): “I say that a thing is continuous when the boundaries (*peras*) at which each of its two parts make contact become one and the same and—as the name itself signifies—fuse (*sunechêtai*)” (*Ph.* V 3 227<sup>a</sup>11–12).

Note 511

**No part of it having magnitude is at rest while another part moves:** The case of a line that rotates around an unmoving internal point in it is excluded by the qualification “having magnitude,” since points have no magnitude (1016<sup>b</sup>25–26).

Note 512

**A thing is said to be one in another way when [1] its underlying subject is undifferentiated in form, and [2] it is undifferentiated when its form is perceptually indivisible:** “We say that if things have indeed been mixed, the mixture must be homoeomerous, and, that just as any part of water is water, so it is with what has been compounded. But if mixing (*mixis*) is just a combination of small particles . . . being mixed will be relative to perception, and the same thing will be mixed to one person whose sight is not sharp, whereas for Lynceus [the legendarily sharp-eyed Argonaut] nothing will be mixed” (*GC* I 10 328<sup>a</sup>10–15). Thus if we include Lynceus in the class of perceivers, [1] and [2] will be equivalent. Aristotle’s discussion of wine (next note) suggests that this is what he has in mind.

Note 513

**The relevant underlying subject . . . is either [1] the first or [2] the last relative to [3] the end:** Start with wine, which is [3] the end (of the relevant process of coming to be or production), and work down. The first underlying subject you encounter is [1] the matter that is the wine itself, and the last one you reach is [2] water, which, as an Aristotelian element, cannot be further divided (*Δ* 24 1023<sup>a</sup>26–29). When considered simply as wine, wine is one because at level [1] it is perceptually undifferentiated in form. Considered as a juice, however, it is one for a different reason, namely, that at level [2] it is water. But this is not something, surely, that we can simply perceive about it. Rather it seems to presuppose something like the following view: “Mixtures of water and earth should be classified in accord with which predominates. For some sorts of wine—for example, must—solidify when boiled. In all such cases, it is the water that is driven off in the process of drying. An indication of this is that the vapor from them condenses into water if collected, and so whenever some sediment is left it must be earthy” (*Mete.* IV 7 384<sup>a</sup>3–8; also 10 388<sup>a</sup>34–<sup>b</sup>11). This is consistent with the classifications of wines generally as “watery (*hudatos*)” (IV 5 382<sup>b</sup>13, 10 389<sup>a</sup>10), since even wines like must are predominantly water. Similarly, oils are mixtures of water and air (IV 7 383<sup>b</sup>23, 384<sup>a</sup>15, 10 388<sup>a</sup>32), but are classed as watery because they are predominantly water.

## Note 514

**The ones higher than these:** Reading τὰ ἑνωτέρω τούτων, which OCT brackets for deletion. The phrase glosses—or, better, corrects—“the higher genus,” since if F and G are the ultimate species in their genus, and H is the next highest species, and J the next highest, and K the highest, then F and G are not just one H, but one J and one K as well.

## Note 515

**Things are said to be one when the account that states the essence is indivisible from another that makes the thing clear:** An account X that states the essence of something makes it clear or brings it to light. For X to be divisible from an account Y that makes clear that same thing, X and Y would have to separate that thing from itself in time, place, or account (1016<sup>b</sup>1–3). But this is impossible. So X and Y must be (or be variants of) the same account (Iota 1 1052<sup>a</sup>29–34).

**Intrinsically every account is divisible:** See Z 10 1034<sup>b</sup>20–22.

## Note 516

**In this way too what has increased in size (*ēuxēmenon*) and is diminishing in size (*phthinton*) is one, because its account is one:** “Just as in the case of plane figures, each thing keeps the same account as regards its form whether it is smaller or larger. For both a larger and a smaller triangle are equally a triangle and one if they have the same form” (Alex. *In Metaph.* 366.21–24 = Dooley 5, 38). The difference in tense between *ēuxēmenon* (perfect participle) and *phthinton* (present participle), however, suggests that the relevant difference may be as much or more one of time as of size. What has increased in size by time  $t_1$  may be the same in account as what is diminishing in size at time  $t_2$ .

## Note 517

**These things are most of all one, and of these those that are substances are most of all one:** To understand the pale of Socrates (say) is to understand what it is to be that pale (or what its essence is), and to understand this is to understand that it is (a particular instance of) such-and-such a *quality*, which is to understand that is the sort of thing to be in a particular substance (Socrates) as its underlying subject, which is to understand that its being one is parasitic on that substance’s being one. Similarly, for all other non-substances (T 2 1003<sup>b</sup>5–10, 22–24).

## Note 518

**If insofar as something is a human it does not admit of division, it is one human, if insofar as it is an animal, one animal, if insofar as it is a magnitude, one magnitude:** To be understood as follows: if X is a human or an animal or a magnitude that does not admit of division in way A, X is one human or animal or magnitude in way A. Thus if X does not admit of division in number insofar as it is a human, animal, or magnitude, it is in number one human, one animal, or one magnitude. If it does not admit of division in form insofar as it is human, animal, or magnitude, it is in form one human, one animal, or one magnitude. This does

not preclude humans, animals, or magnitudes that are one in form from not being one in number or in some other way.

Note 519

**That is why of all lines the circle is to the highest degree one, because it is whole and complete:** See Iota 1 1052<sup>a</sup>27–28n.

Note 520

**To be one, however, is to be a sort of starting-point of number:** Omitting τοῦ, added in OCT. See Iota 1 1052<sup>b</sup>15–1053<sup>b</sup>8. “A number is several ones” (*Ph.* III 7 207<sup>b</sup>7).

Note 521

**[One] in kind, those whose figure of predication (*schêma tês katêgorias*) is the same:** Those that belong in the same category (A 981<sup>a</sup>3n(7)). Thus, unlike at 1016<sup>a</sup>24, kind (*genos*) here = category.

**[One] by analogy, those related as another thing is to another thing:** See N 6 1093<sup>b</sup>18–20. This way of being one has not been previously discussed.

Note 522

**Their matter, whether primary or ultimate:** See 1016<sup>a</sup>20n (primary), Z 10 1035<sup>b</sup>30n (ultimate).

Note 523

**We say that the just (*ton dikaion*) is musical . . . :** Alternatively: “We say that the just [that is] musical is a being, and the human that is musical, and the musical that is human.” See 1017<sup>a</sup>27–30 and Γ 4 1007<sup>b</sup>5n.

Note 524

**The thing itself, to which belongs that thing of which it itself is predicated, is a being:** The thing itself = the human (in Aristotle’s example of [1c]). That of which it (the human) is itself predicated = the musical, which in fact belong to (or is an attribute of) the human, which is a being.

Note 525

**The things said to be intrinsically are the very ones signified by the figures of predication:** See A 1 981<sup>a</sup>3(7).

Note 526

**“It is not” that the diagonal is commensurable signifies that this is false:** See A 2 983<sup>a</sup>16n.

Note 527

**When something is capable and when it is not yet capable must be determined elsewhere:** See Θ 7.

Note 528

**The simple bodies . . . and bodies in general and the things composed of them:** See Z 2 1028<sup>b</sup>8–15.



**Both animals and divine beings (*daimonia*):** Daimons are either gods or the children of gods (Plato, *Ap.* 27c10–d3). To *daimonion* is the sphere of such beings and thus of religious issues generally. Here, however, *daimonia* are the divine beings or gods (*theia*), as they are more often called, that are the heavenly bodies (E 1 1026<sup>a</sup>17–22, A 8 1074<sup>a</sup>30–31). Like the terrestrial animals, with which they are coupled here, they are relevantly like living beings: “We think about the stars as bodies alone, that is, as unitary things that, although they have an order, are otherwise wholly inanimate, but we should posit them as having a share of action and life” (*Cael.* II 12 292<sup>a</sup>18–21).

#### Note 529

**The soul in the case of an animal:** See A 18 1022<sup>a</sup>32, Z 10 1035<sup>b</sup>14–16, DA II 1 412<sup>a</sup>27–29.

#### Note 530

**Those component parts of such things that . . . signify a this something:** See B 5 1001<sup>b</sup>33n.

**As, for example, the body is by the plane’s . . . and the plane by the line’s:** For Aristotle’s own view on bodies, lines, and planes, see M 2 1077<sup>a</sup>24–<sup>b</sup>14.

**As some people say:** See B 5 1002<sup>a</sup>4–11, A 11 1019<sup>a</sup>2–4, Z 2 1028<sup>b</sup>16–27.

#### Note 531

**The essence, the account of which is a definition:** See Z 5 1031<sup>a</sup>1–14.

#### Note 532

**Something is said to be substance in two ways, either it is [a] the ultimate underlying subject . . . or [b] . . . the shape and form of each thing:** Since [a] = [1], [2–4] are now apparently lumped together under [b]. [3] is included there, presumably, because the parts at issue are parts of the form (Z 11).

**That which, being a this something:** See H 1 1042<sup>a</sup>29, @ 7 1049<sup>a</sup>35, A 3 1070<sup>a</sup>11, 13–15.

**Is also separable:** Some forms are separable only *in account* from the perceptible particulars (matter-form compounds) that are the most generally recognized examples of substances: “In another way nature is the shape and form of things that have in themselves a starting-point of movement, something which is not separable except in account” (*Ph.* II 1 193<sup>b</sup>3–5; also H 1 1042<sup>a</sup>24–29). The forms of non-perceptible, or intelligible, matterless substances, however, are separable in the stronger sense of being ontologically independent of perceptible particulars (Z 7 1032<sup>b</sup>1–2, 11 1037<sup>a</sup>25–<sup>b</sup>5, A 3 1070<sup>a</sup>22–26, 6 1071<sup>b</sup>5–22, 7 1073<sup>a</sup>3–5, 8 1074<sup>a</sup>35–36). On what separability amounts to for substances, see Z 1 1028<sup>a</sup>34n.

#### Note 533

**Some things are said to be the same:** Sameness is also discussed in Iota 3 1054<sup>a</sup>32–<sup>b</sup>3, *Top.* I 7, VII 1 152<sup>b</sup>30–33.

#### Note 534

**Universals belong intrinsically, whereas coincidents do not belong intrinsically:** If every human were musical, musical would belong universally to humans,

and so would belong intrinsically rather than coincidentally to them, with the result that no human would be coincidentally musical.

Note 535

**In the case of particulars they are said of them unconditionally:** We can often replace a generic noun phrase, such as “the human,” “the tiger,” “the telephone,” with a universally quantified one, “all humans,” “all tigers,” “all telephones”—which is why we cannot say unconditionally that, for example, “the human is musical,” since not all humans are musical. The fact, on the other hand, that we cannot replace “Socrates” or any other singular term with a universally quantified phrase (for example, “every Socrates”) thus removes the obstacle to saying that Socrates and musical Socrates are unconditionally the same. (Think: if Socrates is pale, all Socrateses are pale.)

Note 536

**Some things, then, are said to be the same . . . intrinsically and in as many ways as things are said to be one:** It is not entirely clear that this is true, see  $\Delta$  6 1015<sup>b</sup>35–1016<sup>b</sup>17.

Note 537

**Things are said to be OTHER:** For a different classification, see Iota 3 1054<sup>b</sup>14–18.

Note 538

**Those thing are said to be DIFFERENT (*diaphora*) which are distinct, though they are the same something:** *Diaphora* in a more technical sense are differentiae, which are special to a species or genus (Iota 3 1054<sup>b</sup>24–1055<sup>a</sup>2, 4 1055<sup>a</sup>26).

**Only not in number (*mê monon arithmô[i]*):** The more usual—but here incorrect—meaning of the phrase is “not only in number.”

Note 539

**Those that have distinctness in their substance:** These are things whose substances, or essences, are distinct, because one has one set of differentia and the other has another.

Note 540

**Things are said to be SIMILAR:** For a different classification, see Iota 3 1054<sup>b</sup>3–13.

Note 541

**The majority of those contraries with respect to which alteration (*alloiousthai*) is possible:** “There is alteration (*alloiôsis*) when the underlying subject persists and is perceptible but change occurs in the attribute that belong to it, whether these are contraries or intermediates” (GC I 4 319<sup>b</sup>10–12); “There is alteration only in things that are said to be intrinsically affected by perceptibles” (Ph. VII 3 245<sup>b</sup>4–5). **Or those with more control (*kuriôtera*):** *Kuriôtera*, which may mean something quite non-specific, such as “more important,” or “more basic,” may here more specifically refer to those attributes that exert the most control over our perception of similarity ( $\Delta$  21 1022<sup>b</sup>15–18).

## Note 542

**Gray and white do not belong at the same time to the same thing, because their components are opposed:** “It is possible that white and black should be so juxtaposed that each is invisible because it is very small, but that what is composed of both is visible. This can appear neither as white nor as black. But since it must have some color, and cannot have either of these, it must be some kind of mixture—that is, some other kind of color. Such then is a possible way of supposing there to be a plurality of colors beyond white and black, but which are a plurality because of the ratio [of white to black in them]. For these may be juxtaposed in the ratio 3 : 2 or 3 : 4, or in ratios expressible by other numbers, or they may be in no numerically expressible ratio, but in some incommensurable relation of excess or deficiency” (*Sens.* 3 439<sup>b</sup>19–30). Hence the components of gray are black and white and the reason that gray and white do not belong to something at the same time is that these components are opposed. The intermediates referred to in the account of alteration given at *GC* I 4 319<sup>b</sup>10–12 are like gray in this respect (1018<sup>a</sup>25n).

## Note 543

[1] **Those things differing in genus that cannot belong at the same time to the same thing:** For example, nothing can be both just and unjust, although “justice and injustice are in contrary genera, since the genus of one is virtue, of the other, vice” (*Cat.* 11 14<sup>a</sup>22–23).

[2] **The most different of the things in the same genus (*genos*):** See *Iota* 4 1055<sup>b</sup>13–17.

[3] **The most different of the things in the same recipient (*en tautô[i] dektikô[i]*):** The meaning of *en tautô[i] dektikô[i]* is made clear by the following text: “Contraries both in other areas and in natural ones always occur, it is evident, in the same recipient (*en tô[i] autô[i] dektikô[i]*) and are attributes of the same beings. I mean, for example, health and sickness, beauty and ugliness, strength and weakness, sight and blindness, hearing and deafness” (*Somn.* 1 453<sup>b</sup>27–31). Since the same particular being can have one of these contraries without ever having the other, as Socrates always had sight and was never blind, it is not to particular beings that *tô[i] autô[i] dektikô[i]* refers but to the correlative kind entailed by the contraries (*I* 2 1004<sup>a</sup>9–20n). The difference between [2] and [3] seems to lie in breadth or scope of the kinds involved: [2] tells us that the kind within which a pair of contraries A and not-A are most different may be as broad as a category; [3] tells us that it may be as narrow as a genus or species.

[4] **The most different of the things falling under the same capacity (*dunamin*):** *Dunamis* seems equivalent to *epistêmê* (“science”) here, as it often, though not always, is elsewhere (*Rh.* I 4 1359<sup>b</sup>9–16), so that [4] seems to rely on the view that a single science must deal with a single genus (*Iota* 4 1055<sup>b</sup>31–32).

[5] **The things whose difference is greatest either [a] unconditionally or [b] in genus or [c] in species:** [b] seems to be equivalent to [2] and [4], and [c] to [3]. The difference between A and not-A would presumably be [a] unconditionally greatest if it did not cease to be greatest when we add the qualification [b] “in genus” or [c] “in species.” Since contraries that are not in the same genus to

begin with cannot be in the same species either, [a] seems to be equivalent to [1]. Such contraries will, however, belong to a correlative kind, which in their case will be a category: “It is most of all with regard to place that contrariety of [things in the category of] *quantity* seems to belong. For people posit up as contrary to down. . . . And they probably derive from these their definitions of the other contraries as well, since they define as contraries those things in the same genus [= category (as at Δ 6 1016<sup>b</sup>32)] that are most distant from each other” (*Cal.* 6 6<sup>a</sup>11–18).

Note 544

**Same, other, and contrary must be distinct in each category (*katēgorian*):** See A 1 981<sup>a</sup>3n(7).

Note 545

**Things said to be DISTINCT IN SPECIES:** Discussed in greater detail in *Iota* 8–9.

Note 546

**Any things that, being in the same substance, have a difference:** See *Iota* 8 1058<sup>a</sup>6–8.

Note 547

**Some place defined either by nature (for example, the middle or the last place):** See K 10 1067<sup>a</sup>8n.

Note 548

**The deliberate choice is starting-point:** See A 1 1013<sup>a</sup>21n.

Note 549

**Prior in account:** A is prior in account to B if and only if the account of B involves that of A, while the account of A does not involve that of B (Z 1 1028<sup>a</sup>35–36, M 2 1077<sup>b</sup>3–4).

Note 550

**In a way, then, all the things that are said to be prior and posterior are said to be such with reference to these (*tauta*):** That is to [4] the sort of priority in nature and substance defined in terms of ontological independence.

Note 551

**Some things can be without others with respect to coming to be (for example, the whole without the parts), others, with respect to passing away (for example, the part without the whole):** When the whole is a unified substance and not a mere aggregation of parts, it can actually come to be without the parts actually coming to be, since it is only when it is dissolved into them that they actually exist (1019<sup>a</sup>10–11).

Note 552

**Similarly in the other cases too:** Namely, [1]–[3].

## Note 553

**Δ 12:** The topics of this chapter are returned to in Θ 1.

## Note 554

**The craft of making healthy, which is a capacity, might be a component of the thing being made healthy, but not of it insofar as it is being made healthy:** As would happen in the case in which a doctor heals himself. See Δ 4 1014<sup>b</sup>20n.

## Note 555

**If this is not possible, things will be capable homonymously:** Reading εἰ δὲ μὴ, ὁμωνύμως at the end of the sentence with Ross.

## Note 556

**Some things, then, are also said to be incapable in accord with this sort of incapacity, others are in another way both capable and incapable:** Reading καὶ ἀδύνατα δὲ τὰ μὲν κατὰ τὴν ἀδυναμίαν ταύτην λέγεται, τὰ δὲ ἄλλον τρόπον, οἷον δυνατόν τε καὶ ἀδύνατον with Ross. OCT omits δὲ (“then”) and brackets οἷον (“for example”) for deletion.

**Namely [POSSIBLE and IMPOSSIBLE]:** *Dunaton* means both “capable” and “possible”; *adunaton*, both “incapable” and “impossible.”

## Note 557

**Something like that is a falsehood whose contrary is not only true but also necessary:** Omit ἀσύμμετρον εἶναι with Ross.

## Note 558

**What in geometry is said to be a POWER (*dunamis*) is so by metaphorical transference:** As when we say that 9 is 3 to the power of 2 or 3<sup>2</sup>, or that the power set of a set with *n* members has 2<sup>*n*</sup> members.

## Note 559

**The strict (*kurios*) definition of the primary sort of capacity:** See A 1 981<sup>b</sup>11n.

## Note 560

**QUANTITY:** *Cat.* 6 gives a somewhat richer account: (1) Some quantities are discrete (numbers, spoken words); others continuous (lines, surfaces, bodies, time, place) (4<sup>b</sup>20–25). (2) Some are composed of parts which have position in relation to one another (the parts of a line or a plane); others are not composed of such parts (the parts of time have an order but not a position, since no two of them can exist simultaneously) (5<sup>a</sup>15–37). (3) A quantity (for example, four-foot or five-foot) has no contrary (5<sup>b</sup>11–14). Many and few, large and small, which might seem to be counterexamples, are in fact relatives, since “nothing is called intrinsically large or small but in relation to something else” (5<sup>b</sup>16–18). (4) Quantities do not admit of more and less: “one thing is not more four-foot than another” (6<sup>a</sup>19–25). (5) What is most distinctive of quantities is that they are either equal or unequal (6<sup>a</sup>26–35).

**When it is divisible into components each of which is by nature . . . a this something:** See B 5 1001<sup>b</sup>33n.

Note 561

**The musical** (*to mousikon*) is **coincidentally a quantity**: *To mousikon* is intrinsically a craft or capacity, which as such is not a quantity. But it is coincidentally a quantity, because it can coincide with something, whether a human being or an instrument, that is of a certain quantity.

Note 562

**What is said to be a QUALITY**: *Cat.* 8 gives a somewhat different classification. (1) States (*hexis*), such as the virtues and types of scientific knowledge, which are relatively permanent and difficult to change; dispositions (*diathesis*), such as being hot or ill, which are relatively impermanent and easy to change (8<sup>b</sup>26–9<sup>a</sup>13). (2) Anything that we are called in virtue of a natural capacity, such as being a boxer, or incapacity, such as softness rather than hardness (9<sup>a</sup>14–27). (3) Affective qualities and affections, such as sweetness, bitterness, sourness (9<sup>a</sup>28–10<sup>a</sup>10). (4) Figure (*schêma*) and the external shape or form (*morphê*) of a thing (10<sup>a</sup>11–16).

Note 563

**Composite ones, which are not in one dimension only, but of which the plane and the solid are representations** (these being the ones that have two or three factors): See M 8 1083<sup>a</sup>9–11n.

Note 564

**The substance of each is what it is one times**: If, for example, being square were a proper differentia of 6 ( $= 2 \times 3$ ), the substance (essence) of 6 could not be what it is one times ( $1 \times$ ). But being square is only a “sort of differentia” (1020<sup>b</sup>16). For it is a differentia not of 6 taken intrinsically, but only of 6 as represented by a certain geometrical figure, namely, a square.

Note 565

**Quality is a sort of differentia of substances, but either not of moving things or not of them insofar as they are moving**: Because the qualities of things that move (sense [2]) are things with respect to which they are said to alter when these change. Differentiae, by contrast, being parts of a thing’s substance or essence, are unchangeable.

Note 566

**Virtue and vice**: “Virtue . . . is a deliberately choosing state, which is in a medial condition in relation to us, one defined by a reason and the one by which a practically-wise person would define it. Also, it is a medial condition between two vices, one of excess and the other of deficiency. Further, it is also such a condition because some vices are deficient in relation to what the relevant feelings and actions should be and others are excessive, but virtue both finds the mean and chooses it” (NE II 7 1106<sup>b</sup>36–1107<sup>a</sup>6). More generally, anything that has a function or *ergon* (B 2 996<sup>b</sup>7n) has a correlative *aretê*, which is the state of it that enables it to perform its function well. Thus it is possible to speak of the *aretê* of thieves, scandalmongers, and other bad things that are good at doing what they do (Δ 16 1021<sup>b</sup>12–23),

as well as of the *aretê* of non-living tools and instruments. For this reason *aretê* is sometimes translated as “excellence.”

Note 567

**Nobly or basely:** See M 3 1078<sup>a</sup>31–32n.

Note 568

**Deliberate choice:** See Δ 1 1013<sup>a</sup>21n.

Note 569

**Things are said to be RELATIVE:** “We call relatives all such things as are said to be just what they are, *of or than* other things, or in some other way in relation to something else. For example, [a] what is larger is said to be *than* something else, since it is said to be larger than something, and [b] what is double is said to be *of* something else, since it is said to be double of something. Similarly with all other such cases” (Cat. 7 6<sup>a</sup>36–b2). [b] is included in [2] here; [a] is not mentioned.

Note 570

**The way that has been stated elsewhere:** See Θ 9 1051<sup>a</sup>29–33, M 10 1087<sup>a</sup>10–25.

**Activations (*energeiai*) [that are said to be such] with reference to movement do not belong to them:** See H 2 1042<sup>b</sup>8–11n, Θ 1 1045<sup>b</sup>34–1046<sup>a</sup>2.

Note 571

**It is in this way that a father is said to be the father of his son:** A man is the (biological) father of his son in virtue of having begotten him in the past, not in virtue of any present relationship there may be between them.

Note 572

**Things that are said to be relative with reference to a number or a capacity are all relative because of being said to be just what they are of another thing (*tô[i] hoper estin allou*), not because of the other thing's being relative to them:** As, for example, the double is a definite number relative to one, since it is the double of one, but one is not said to be what it is by being anything of its double (Δ 14 1020<sup>b</sup>7–8). On the sense of *hoper*, see Γ 2 1003<sup>b</sup>33n.

Note 573

**The thought is not relative to what it is a thought of, since we would then have said the same thing twice:** A thought T is defined by its object X, so that T is by definition “the T of X.” If X did not have an independent definition, it would have to be defined as “the X that T is the T of.” Then T would be defined as “the T of the X that T is the T of,” so that we would say the same thing twice (on which see Z 11 1037<sup>a</sup>30–32n). Cat. 7 adds another important difference: “Relatives seem by nature to be at the same time. And in most cases this is true. For at the same time as there is a half there is a double, and at the same time as there is a slave there is a master, and similarly with the others. Also each does away with the other. For if there is not a half there is not a double. And so too with the other cases. Yet it does not seem to be true of all relatives that they are by nature at the same time. For the scientifically knowable would seem to be prior [in nature] to scientific

knowledge. . . . And the case of perception is similar to this. For what is perceptible seems to be prior [in nature] to perception. For doing away with what is perceptible simultaneously does away with perception, but doing away with perception does not simultaneously do away with what is perceptible" (7<sup>b</sup>15–33).

Note 574

**Medicine is included among the relatives because its genus, scientific knowledge, seems to be a relative:** Compare: "Scientific knowledge, a genus, is said to be just what it is of another thing (it is said to be scientific knowledge of something), but none of the particular cases is said to just what it is of another thing—for example, grammar is not said to be grammar of something or music music of something. If they too are said to be relative to something at all, it is with reference to the genus—for example, grammar is said to be scientific knowledge of something, not grammar of something, and music is said to be scientific knowledge of something, not music of something. So the particular cases are not relatives" (*Cat.* 8 11<sup>a</sup>24–32; also *Top.* IV 4 124<sup>b</sup>18–19).

Note 575

**Virtue:** See *Δ* 14 1020<sup>b</sup>18–25n.

Note 576

**The form (*eidos*), whatever it may be, of a spatial magnitude or of what has spatial magnitude:** *Eidos* here means shape or spatial arrangement rather than the form that is identical to essence.

Note 577

**The end of each thing (that toward which there is movement or action, not that from which):** "Of action, then, the starting-point—the source of the movement, not what it is for the sake of—is deliberate choice, and of deliberate choice, the starting-point is desire and reason that is for the sake of something" (*NE* VI 2 1139<sup>a</sup>31–34).

**Sometimes it is both, that from which and that toward which:** "Understanding is both starting-point and end, since [practical] demonstrations are from these and concerned with these" (*NE* VI 11 1143<sup>b</sup>10–11). Understanding is what grasps all starting-points (6 1141<sup>a</sup>7–8); the starting-point of a practical demonstration is the for-the-sake-of-which (5 1140<sup>b</sup>16–17); so understanding is both end and starting-point.

Note 578

**The substance of each thing and the essence of each. For this is the limit of knowledge:** The substance or essence of each thing (and so its definition) is a starting-point of scientific knowledge, grasped by understanding, and so is a limit in the sense of that from which (*A* 1 981<sup>a</sup>3n). But it can also be a limit in the sense of that to which (*A* 9 1074<sup>b</sup>33–35), as it is in the case of the sort of knowledge (not scientific or demonstrative, obviously) that is a search for the definitions of essences.



## Note 579

**Something is said to be that IN VIRTUE OF WHICH (*kath' ho*) in many ways:** No single English expression naturally captures all the various senses of *kath' ho*.

**The form and the substance of each thing—for example, that by which a man is good is good itself (*auto agathon*):** This could be: (1) an endorsement of Plato's account, so that good itself = good-itself (the Platonic Form of the good)—if so, it is one that is abandoned in *NE* I 6; (2) a reference to but not an endorsement of Plato's account, meaning “as in Plato's account that by which a man is good is good-itself”; (3) an expression of Aristotle's own view that it is the presence in them of things that are intrinsically (or in virtue of their form or essence) good that other things are good (1022<sup>a</sup>21–22, *Γ* 4 1007<sup>b</sup>4n). (3) is perhaps the more likely of these options.

## Note 580

**The primary thing in which something by nature comes to be—for example, color in a surface:** The surface is that in virtue of which the color exists, since for a color to exist is for a surface to have the color's defining ratio of white to black present in or on it (*Δ* 10 1018<sup>a</sup>24–25n).

## Note 581

**The matter of each thing and the first underlying subject of each:** See *Λ* 2 1069<sup>b</sup>24–26.

## Note 582

**Since all these signify position or place:** Reading πάντα γὰρ ταῦτα τόπον σημαίνει καὶ θέσιν for OCT misprinted πάντα γὰρ τόπον σημαίνει καὶ θέσιν.

## Note 583

**Callias is intrinsically Callias, and the essence of Callias:** See *Z* 6 1032<sup>a</sup>4–8n.

## Note 584

**Anything that is present in the what-it-is (*tô[i] ti estin*):** Here, as often, the what-it-is = the essence.

## Note 585

**A human has many causes, the animal, the two-footed, nonetheless a human is intrinsically a human:** See *H* 6 1045<sup>a</sup>14–33. On how to understand “the animal” and “the two-footed,” see *Z* 10 1035<sup>b</sup>1–3n.

## Note 586

**Further those attributes are intrinsic to a subject that belong to it alone, and insofar as they belong to it merely because of itself considered as what is separate by itself:** Reading ἔτι ὅσα μόνῳ ὑπάρχει καὶ ἢ μόνον δι' αὐτὸ κεχωρισμένον καθ' αὐτό with Ross for OCT ἔτι ὅσα μόνῳ ὑπάρχει καὶ ἢ μόνον; διὸ τὸ κεχωρισμένον καθ' αὐτό (“Further, those [attributes] are intrinsic to [a subject] that belong to it alone, which is why what is separate is what is intrinsic”).

Note 587

**A HAVING [OR STATE] in one way is a sort of activation of the haver and what he has, like a sort of action or movement:** See K 9 1065<sup>b</sup>33.

Note 588

[3], [4]: Painful injuries and experiences and large-scale misfortunes are *pathê* because they are things that people suffer from and through (A 2 982<sup>b</sup>16).

Note 589

**A being is said to be blind if it does not have sight in that [1] in which (*en hô[i]*), [2] in virtue of which (*kath' ho*), [3] in relation to which (*pros ho*), and [4] in the way in which (*hôs*), is natural:** [1] the medium (normal light, not darkness); [2] the organ (eyes, not ears); [3] the object (color, not sound); [4] for example, the direction (in front, not behind).

Note 590

**As the poets say, Atlas holds up the heaven:** Hesiod, *Theogony*, 517.

**On the supposition that it would fall to the earth otherwise, as some of the physicists also say:** “We should neither suppose it to be the way the poets say nor that, because of its whirling’s having a spatial movement that is faster than its own downward tendency, the heaven is preserved [from falling to the earth] for all this time, as Empedocles says” [DK B35 = TEGP 51 F28] (*Cael.* II 1 284<sup>a</sup>24–26).

Note 591

**Something is said to be OF [OR FROM] (*ek*) something:** Other partial classifications are given at α 2 994<sup>a</sup>22–<sup>b</sup>3, H 4 1044<sup>a</sup>23–25, N 5 1092<sup>a</sup>23–35.

Note 592

**The form is also [composed] of the matter of the form (*to tou eidos hulês*):** The matter of the form is not perceptible matter, but the formal elements from which the form is composed. Any form, then, that is composed of elements has a matter-form structure of a sort. Similarly, the genus is matter for the differentiae, because it is the underlying subject to which they belong (Δ 29 1024<sup>b</sup>8–9, Z 12 1038<sup>a</sup>6–7, Iota 8 1058<sup>a</sup>23–24).

Note 593

**The child is of its father and mother, and plants are of the earth, because they are of a part of these things:** The parts are the various seeds and other seminal products involved (Z 9 1034<sup>b</sup>1–3n).

Note 594

**Merely because they are successive in time:** There is no corresponding sense of “of” in English, although there is a relatively close one: “He came of a Sunday” means he came on a Sunday.

**The festival of the Thargelia:** A feast of Apollo, held in Athens and some other cities in late May.

**The Dionysia:** The City or Great Dionysia was a feast of Dionysus held at the end of March.

## Note 595

**Only the ones among the first lot that are measures:** See Iota 1 1052<sup>b</sup>20–27.

## Note 596

**We say that the species of a genus are its parts** (*moria*): *Morion* is here used as a synonym of *meros*, which is the chapter's topic.

## Note 597

**Of the bronze sphere or the bronze cube both the bronze (that is, the matter in which the form is) and the angle are parts:** The angle (= the form) is the one definitive of the figure.

## Note 598

**The things in its account that make a given thing clear are also parts of the whole** (*tou holou*): *To holon* here, as at  $\Delta$  2 1013<sup>b</sup>22, is the form, not the compound of matter and form.

## Note 599

**Potentially . . . actively:** See A 9 992<sup>b</sup>15n, H 2 1042<sup>b</sup>10n.

## Note 600

**Those which are naturally of such a sort are wholes to a higher degree than those are so by craft, as we also said in the case of what is one:** At  $\Delta$  6 1016<sup>a</sup>4.

## Note 601

**Not just any random quantity is said to be DOCKED** (*kolobon*): The adjective *kolobos* means “docked” (as in docking a puppy’s tail, or docking someone’s salary), “curtailed,” “stunted,” “truncated”—the central idea is that of cutting off a non-essential projecting part. None of these English terms fits all the cases Aristotle cites in an entirely natural way. “Mutilated” is the traditional rendering but suffers the disadvantage of not capturing the central idea: mutilation need not involve the cutting off of a part; cutting off a part need not result in mutilation.

## Note 602

**A musical scale cannot become docked:** Because it is not continuous.

## Note 603

**The parts that control the substance:** See Z 10 1035<sup>b</sup>25–27n.

## Note 604

**This is why bald people** (*phalakroi*) **are not “docked”:** Perhaps, because in some cases, at least, their hair can grow back: “Hairs plucked out before maturity, but not later, will grow again. . . . Those who suffer from varicose veins go bald less; and sometimes, if they are already bald when this takes hold of them, their hair grows back thicker” (*HA* III 11 518<sup>b</sup>12–27). Nonetheless, in most cases the hair does not grow back (*GA* V 3 783<sup>b</sup>8–22), making baldness a not entirely apposite example. It may be, then, as some have suspected, that Aristotle is making a joking reference to his own baldness.

Note 605

**The former come from Hellen and the latter from Ion as their first begetter:** Hellen was the eponymous ancestor of the Hellenes (eventually a name applying to all Greeks). His son Xuthus was the father of Ion, the ancestor of the Ionians. Deucalion, his son or brother, was the husband of Pyrrha.

Note 606

**More so when from the male begetter than from the matter, although the race is also sometimes named from the female:** The male is the source of the offspring's form, the female of its matter (Z 9 1034<sup>b</sup>1–3n).

Note 607

**As the first constituent in accounts is said to be—the one said in the what-it-is:** The account (A 1 981<sup>a</sup>15n) or definition of something consists of its genus and its differentiae (Z 12 1027<sup>b</sup>29–30), of which the genus is stated first: “the genus is intended to signify the what-it-is, and is placed first of the things said in the definition” (Top. VI 5 142<sup>b</sup>27–29). Sometimes both elements are included in the what-it-is or essence: “genera and differentiae are predicated in the what-it-is” (VII 3 153<sup>a</sup>17–18; also APo. II 5 91<sup>b</sup>28–30, 13 97<sup>a</sup>23–25). But sometimes, as here, the genus tells us what the thing is while the differentiae tell us what sort or quality of thing it is (*poion ti*): “a thing's differentia never signifies what it is, but rather some quality (*poion ti*)” (Top. IV 2 122<sup>b</sup>16–17; also 6 128<sup>a</sup>26–27, Δ 14 1020<sup>a</sup>33).

Note 608

**Whose differentiae the qualities are said to be:** See Δ 14 1020<sup>a</sup>33–<sup>b</sup>2 (= [1]).

Note 609

**Those that are said of things with reference to distinct figures of predication of being** (*kath' heteron schêma katêgorias tou ontos legetai*): See Δ 7 1017<sup>a</sup>23n, Iota 3 1054<sup>n</sup>29.

Note 610

**Some beings signify what it is, others a quality, others the various other things that were distinguished earlier:** At Δ 7 1017<sup>a</sup>24–27.

Note 611

**What is said to be false in one way is what is false as a thing:** See Θ 10 1051<sup>a</sup>34–<sup>b</sup>5.

Note 612

**Something is false as a thing if it is not combined or cannot be combined—as is said, for example, of the diagonal's being commensurable with the side or of you being seated:** The object (state of affairs) that is *the commensurable diagonal* or *the seated you* is false because diagonal and commensurable cannot be combined, and because you and seated are not in fact combined, since you are standing up. See E 4 1027<sup>b</sup>18–23.

Note 613

**Illusionistic painting** (*skiagraphia*): A *skiagraphia* or shadow-painting employed shading to create an illusion of solidity, especially from a distance.

## Note 614

**A false account, insofar as it is false, is of things that are not:** See also I 7 1011<sup>b</sup>25–29, E 4.

**Which is why every account is false of something other than what it is true of:** An account or definition of A could be given (1) as the combination of the definiendum and the definiens with the sign for identity by definition (“A =<sub>def</sub> B”), or (2) as the definiens alone (B) or with the sign for identity by definition (“=<sub>def</sub> B”). Since (1) cannot be false of anything, whereas (2) can, Aristotle seems to be thinking of accounts and definitions here as given by (2). The following, however, might be taken to suggest that he also thinks of them as being like (1): “Putting it simply, though, let us call everything definitional that falls to the same methodical inquiry as definitions. And it is immediately clear that all the cases just mentioned are of this sort. For if we are able to argue dialectically that things are the same and that they are distinct, then we shall also be well equipped to attack definitions in the same way, since by showing that the two things are not the same we will have done away with the definition” (*Top.* I 5 102<sup>a</sup>9–14).

## Note 615

**Each thing has in a way one account, that of its essence, and in a way many, since both it itself and it with an attribute are in a way the same:** Socrates and musical Socrates or wise Socrates are in a way the same, so accounts of wise Socrates and musical Socrates are also in a way accounts of Socrates (*Z.* 4–5 discusses).

## Note 616

**Antisthenes [of Athens]:** A follower of Socrates, present at his death. He wrote widely, including on topics in what we would now call the philosophy of language, and in many genres, including Socratic dialogues. 1024<sup>b</sup>29–34 = SSR V A 152 (p. 195).

**Was naïve in thinking that nothing could be fairly put into words (*legein*):** “A *logos* is what makes clear what a thing is or was (*logos estin to ti ên einai ê estin dêlôn*)” (*DL* VI [3] 25–26 = SSR V A 151 (p. 195)). *Legein* is the verb cognate to *logos* in this sense—hence “put into words.” *To ti ên einai* is “essence” in Aristotle (*A* 3 983<sup>a</sup>27–28n).

**Except by the account that properly belonged to it, one to one:** The idea is that an account that does not exactly fit A, and A alone, is not a false account of A, but rather is not an account of A at all. He evidently combined this view with the view that the what-it-is or essence of simple things cannot be said or defined (*H* 3 1043<sup>b</sup>23–32). It is probably Antisthenes’ views that are referred to in Plato, *Euthd.* 283c–284c, 285e–286d, *Crat.* 429d, 432d–e, 433d, *Thi.* 201d–202c, *Sph.* 251b–c.

## Note 617

**It follows that there is no such thing as contradicting:** “There is no such thing as contradicting, as Antisthenes said” (*Top.* I 12 104<sup>b</sup>20–21). The argument was this: Suppose that A =<sub>def</sub> B and A ≠<sub>def</sub> C. X says that A =<sub>def</sub> B, Y says that A ≠<sub>def</sub> B. X and Y appear to contradict one another. But on Antisthenes’ view they do not, since Y

is not talking about A at all. If X says that  $A =_{\text{def}} C$  and Y that  $A \neq_{\text{def}} C$ , they again fail to contradict one another, since neither is talking about A.

**And almost that there is no such thing as speaking a falsehood either:** If “speaking a falsehood (*pseudesthai*)” means “giving a false account of,” then it does follow on Antisthenes’ view that speaking a falsehood is impossible, since speaking a falsehood is contradicting the truth, and contradicting is impossible. But “speaking a falsehood” also has other senses that have nothing to do with accounting for or defining things—Antisthenes himself thought that we could truly say what even a simple or indefinable being was like (H 3 1043<sup>b</sup>26–28). So it only “almost” follows from his views that speaking a falsehood is impossible.

#### Note 618

**Eight is a double number by the account of two:** A number  $m$  is a double number if and only if there is a number  $n$  such that  $m = 2 \times n$ . Hence the account of 2 is part of the account of double number. Using that account, 8 can then be correctly put into words or symbols as  $2 \times (2 \times 2)$ , using the account of something other than itself. Similarly 9 can be falsely put into words, using the account of something else, as it is when we define it as a double number.

#### Note 619

**A false human being, on the other hand, is one who readily and by deliberate choice gives false accounts, not because of something else but because of itself:** Compare: “It is not in virtue of his capacity that someone is a boaster, however, but in virtue of his deliberate choice, since it is in accord with his state of character that he is a boaster, and by being that sort of person. In the same way, someone may be false because he enjoys the falsehood itself or because he desires reputation or profit” (NE IV 7 1127<sup>b</sup>14–17).

#### Note 620

**The argument in the *Hippias*, that the same human being is false and true, is misleading:** The reference is to Plato, *Hp. Mi.* 365d–369b.

#### Note 621

**This false assumption is due to the induction:** At *Hp. Mi.* 373c–376c.

#### Note 622

**Since there are things that belong and things they belong to, and some of them belong to these only in a particular place (*pou*) or at a particular time (*pote*), whatever belongs to a subject, but not because it was this subject, or the time this time, or the place this place, will be a coincident:** Hence, though there is no scientific knowledge of what is (non-intrinsically) coincidental (E 2 1027<sup>a</sup>19–20), there is a coincidental sort: “There is neither [unconditional] demonstration nor unconditional scientific knowledge of what is perishable, but only the coincidental sort, because it does not hold of this universally, but at some time (*pote*) and in some way (*pós*)” (*APo.* I 8 75<sup>b</sup>24–26). It may be, indeed, that *pou* here is used without reference to place, and means essentially the same as *pós*. The idea, in any case, is that the changeability of coincidental truths, which is an obstacle to scientific

knowledge of them (Z 15 1039<sup>b</sup>27–1040<sup>a</sup>7), can be eliminated by “eternalizing” them through the introduction of a sufficient number of variables: “Socrates is sitting” can change its truth value; “Socrates is sitting at time  $t_1$ ” cannot.

#### Note 623

**Coincidents of this [intrinsic] sort may be eternal:** “There are three things in demonstrations: one, the thing being demonstrated, the conclusion (this is what belongs intrinsically to some genus); another, the axioms (axioms are the things on which the demonstration depends); third the subject genus of which the demonstration makes clear the attributes and the intrinsic coincidents” (APo. I 7 75<sup>a</sup>39–<sup>b</sup>1). A triangle is by the definition of its essence a plane figure bounded by three straight lines. It follows, but is not part of its essence, that its interior angles equal two right angles (PA I 3 643<sup>a</sup>27–31).

**Whereas no coincident of the other sort is:** See E 2–3, K 8.

#### Note 624

**The account of this is elsewhere:** B 2 997<sup>a</sup>19–20 mentions intrinsic coincidents (*per se* accidents) as does APo. I 7 75<sup>a</sup>39–<sup>b</sup>1 (quoted in the previous note) and I 22 83<sup>b</sup>19, but only E 2–3 and K 8 contain anything that could be called an account of coincidents.

### BOOK EPSILON (VI)

#### Note 625

E I: Compare K 7, I<sup>1</sup> 1.

#### Note 626

**Every science that proceeds by thinking (*dianoêtikê*) or that has some share in thinking:** The thinking at issue is presumably deduction from starting-points or causes, so that the contrast is to sciences that deal with starting-points themselves (1025<sup>b</sup>15–16).

**Is concerned with causes and starting-points, whether more exactly (*akribesteras*) or more simply (*haplousteras*) considered:** On science, starting-points, and causes, see A 1 982<sup>a</sup>2n; on *akribeia*, M 3 1078<sup>a</sup>10n; on *haplous*, A 3 983<sup>b</sup>14n.

#### Note 627

**All these sciences, however, mark off a certain being, a certain genus:** See K 7 1064<sup>a</sup>2.

**Nor do they produce any account (*logos*) of the what-it-is:** That is, they do not give any demonstration of it (1025<sup>b</sup>14–15).

#### Note 628

**Some making the what-it-is clear by means of the perceptual capacities:** “Once the doctor has defined health and the builder has defined a house, whether by thought or by perception, they give the accounts and the causes of each of the things they produce, and why they must be produced in this way” (PA I 1 639<sup>b</sup>16–19).

**Some getting hold of it as a hypothesis:** Compare Plato's criticism of mathematics at *Rep.* VI 510c2–d3 (quoted in *Γ* 2 1005<sup>a</sup>13n).

**The what-it-is:** See A 5 987<sup>a</sup>20n.

**In a more necessary or in a weaker way:** 'That is, in "a weaker or more exact way" (*K* 7 1064<sup>a</sup>6–7).

#### Note 629

**It is evident from such an induction that there is no demonstration of substance:** The "induction" referred to is the review of the various special sciences that Aristotle has just summarized.

#### Note 630

**It belongs to same sort of thinking to make clear both what it is and whether it exists:** Because both what the genus is and whether it is are scientific starting-points, see A 1 981<sup>a</sup>3n(5).

#### Note 631

**Natural science too is a science concerned with a particular genus (*genos*) of being:** At 1025<sup>b</sup>8 *genos* refers to a (first-order) genus. But natural science, as the science of beings that have natures (*Δ* 4), deals with many (first-order) genera not just with one, since there are many distinct genera of natural beings (*Γ* 2 1003<sup>b</sup>19–20n). Thus natural science is more like universal mathematics, while the genus it studies, like the category of quantity, is an analogical unity. See 1026<sup>a</sup>27n, *Δ* 6 1017<sup>a</sup>2–3, *K* 4 1061<sup>b</sup>27–33.

#### Note 632

**If all thought is either practical or productive or theoretical:** As Aristotle thinks it is, see *K* 7 1064<sup>a</sup>16–19, *Top.* VI 6 145<sup>a</sup>15–16.

**Natural science . . . is concerned with . . . the substance that in accord with its account holds for the most part only, because it is not separable:** The separability in question is the sort of separability from matter that is the mark of primary substances (*Z* 1 1028<sup>a</sup>34n). Substances of the sort studied by natural science are not separable in this way. This is made clear by the account of their substance or essence, which shows it to be analogous to the snub and not to the concave (1025<sup>b</sup>30–1026<sup>a</sup>7). As the snub is concavity in a nose, so a natural essence is such-and-such form in such-and-such sort of perceptible matter (10 1035<sup>b</sup>27–30, 11 1037<sup>a</sup>5–10). And because a natural essence has such a structure—because it involves reference to a sort of perceptible matter—the account of it holds of things only for the most part (*E* 2 1026<sup>b</sup>27–1027<sup>a</sup>15). The sort of substances studied by the primary science, on the other hand, are separable from matter (1026<sup>a</sup>15–16, also *Δ* 8 1017<sup>b</sup>26n).

#### Note 633

**'The account of none of these is without [reference to] movement, but always includes matter:** Movement is the actuality of the potential insofar as it is potential (*K* 9 1065<sup>b</sup>16, 33), and matter is what is potential (*Θ* 8 1050<sup>a</sup>15). Hence anything capable of moving in a certain way must have matter for that sort of movement (*H* 1 1042<sup>b</sup>5–6).



**It belongs to the natural scientist to get a theoretical grasp even on some of the soul, that is, as much of it as is not without matter:** "There is a puzzle too about the attributes of the soul, as to whether they are all also shared by what has the soul or whether there is also some attribute that is special to the soul itself. For it is necessary to attain [a resolution of] this, but it is not easy. It appears that in most cases, though, the soul is neither affected nor does it act without the body—for example, being angry, being confident, appetitively desiring, perceiving in general—whereas understanding seems to be most of all special to the soul. . . . The attributes of the soul—spiritedness, mild-manneredness, fear, pity, confidence, and, further, joy, loving, and hating—would all seem to involve the body, since at the same time as these the body is affected in a certain way. . . . If this is so, however, it is clear that the affections of the soul are enmattered accounts. So their definitions will be of this sort, for example, 'Being angry is a sort of movement of such-and-such a sort of body, or of a part or a capacity, as a result of something for the sake of something.' And this is why it already belongs to the natural scientist to get a theoretical grasp on the soul, either all soul or this sort of soul. But a natural scientist and a dialectician would define each of these differently—for example, what anger is. For a dialectician it is a desire for retaliation or something like that, whereas for a natural scientist it is a boiling of the blood and hot stuff around the heart. Of these, the scientist gives the matter, whereas the dialectician gives the form and the account. For this is the account of the thing, although it must be in matter of such-and-such a sort if it is to exist. And so of a house the account is this, that it is a shelter to prevent destruction by winds, rain, and heat. But one person will say that it is stones, bricks, and timbers, and another that it is the form in them for the sake of these other things. Which of these people, then, is the natural scientist? Is it the one concerned with the matter but ignorant of the account, or the one concerned with the account alone? Or is it rather the one concerned with what is composed of both? Who, then, is each of the others? Or isn't it that there is no one who is concerned with the attributes of the matter that are not separable and insofar as they are they are not separable? And isn't it, rather, the natural scientist who is concerned with everything that is a function or attribute of this sort of body and this sort of matter? And isn't anything not of this sort the concern of someone else, in some cases a craftsman, if there happens to be one, such as a builder or a doctor? And aren't those things that are not actually separable, but are considered insofar as they are not attributes of this sort of body and in abstraction from it, the concern of the mathematician? And insofar as they are actually separable, that of the primary philosopher?" (*DA* I 1 403<sup>a</sup>3–<sup>b</sup>16); "The part of the soul that is called understanding (I mean by understanding that by which the soul thinks and supposes) is none of the beings actively before it understands them. That is also why it is reasonable for it not to be mixed with the body" (*III* 4 429<sup>a</sup>22–25).

#### Note 634

**It is clear that some parts of mathematics get a theoretical grasp on their objects insofar as they are immovable and insofar as they are separable:** "About

these things [the sun, the moon, and certain of their attributes] both the natural scientist and the mathematician do all the work they do, but [1] the mathematician does not get a theoretical grasp on each of them as the limit of a natural body, nor on their coincidents as coincident with such bodies. That is why he separates them. For they are separable from movement in the understanding, and so it makes no difference, nor does any falsity result, if they are separated. Those who speak about the Ideas [namely, Platonists] do the same but they fail to notice it. For they separate the objects of natural science, although these are less separable than the objects of mathematics. This becomes clear when we try to state in each of the two cases the definitions of the things and of their coincidents. For odd and even, straight and curved, and similarly number, line, and figure, can be defined without movement, whereas flesh, bone, and human cannot, but rather all these are said like snub nose and not like curved. This is also clear from [2] the more natural-science-like parts of mathematics, such as optics, harmonics, and astronomy. These are in a way the reverse of geometry. For whereas geometry investigates natural lines, but not insofar as they are natural, optics investigates mathematical lines, but not insofar as they are mathematical" (*Ph.* II 2 193<sup>b</sup>31–194<sup>a</sup>12). [1] describes what we call *pure* mathematics, which are the parts of it referred to here (*K* 3 1061<sup>a</sup>8–35), whereas [2] refers to applied mathematics, which are referred to at 1026<sup>a</sup>14–15.

#### Note 635

**If there is something that is eternal and immovable and separable, it is evident that knowledge of it belongs to a theoretical science—not, however, to natural science . . . nor to mathematics, but to something prior to both:** This primary science is theoretical because, dealing as it does with eternal, immovable, and separable beings, it is "not concerned with anything's coming to be" (*NE* VI 12 1143<sup>b</sup>2), and so cannot be either a practical or a productive science, since these are concerned with things doable in action or producible, and so with "what admits of being otherwise" (4 1140<sup>a</sup>1). It is not natural science because all its objects are immovable and separable, whereas none of those of natural science are. It is not mathematics because only some of its objects are immovable and separable, namely, those of pure mathematics, and these are posterior to the inseparable beings from which they are abstracted. Primary science is prior to both natural science and mathematics because the eternal, immovable, and separate beings it deals with are the starting-points and causes for all the other beings, and so for those studied by natural science and those studied either by pure or applied mathematics: "Since there must always be movement without intermission, there must be something eternal, whether one or many, that first moves things. And the primary mover must be unmoved" (*Ph.* VIII 6 958<sup>b</sup>10–12; also *A* 8).

**For natural science is concerned with certain moveable things:** Reading *περί κινήτων γάρ τινων ἡ φυσική*, which OCT brackets for deletion.

#### Note 636

**Natural science is concerned with things inseparable but (all) not immovable:** Reading *περί ἀχωριστὰ μὲν ἀλλ' οὐκ ἀκίνητα* with the mss. for OCT *περί χωριστὰ μὲν ἀλλ' οὐκ ἀκίνητα* ("things that are separable but not immovable"). As before

(1025<sup>b</sup>28n), the separability in question is separability from perceptible matter. Natural essences, being analogous to snub, are inseparable from it. Since inseparability goes along with movability, we might expect not a contrasting “but,” (*all*) but, rather a conjunctive “and” (“inseparable *and* immovable”). The contrast, however, should be understood as being with the objects of mathematics, which are “immovable but not separable (*akinêta men ou chôrista*).”

**Certain parts of mathematics are concerned with things immovable and not separable but as in matter** (*hôs en hulê[i]*): See 1026<sup>a</sup>10n.

#### Note 637

**All causes are necessarily eternal** (*aidia*): *Aidios*, used at 1026<sup>a</sup>10 to mean “eternal,” must have the same meaning here. This restricts the relevant sort of cause to first causes, since only they, on pain of infinite regress, are eternal (α 2).

#### Note 638

**They are the causes of the divine beings that are perceptible** (*phanerois*): These divine beings are the stars and heavenly bodies (A 7 1072<sup>a</sup>26–30, 8 1073<sup>a</sup>23–<sup>b</sup>1, *Cael.* II 2 285<sup>a</sup>29–30). The causes of these are their immovable movers (A 8).

#### Note 639

**There must, then, be three theoretical philosophies, mathematical, natural, and theological:** (1) There are three different sorts of accounts of the “whats” that things are, or of the substances or essences that they have, depending on whether they are natural objects, objects of mathematics, or divine objects. (2) These essences, or the accounts or definitions of them, are starting-points of the different theoretical sciences (natural, mathematical, and theological). (3) The philosophies associated with these sciences are concerned with their starting-points (A 2 982<sup>b</sup>13n). (4) Therefore, there must be three theoretical philosophies (which, at K 7 1064<sup>b</sup>1–3, are—somewhat less accurately (?)—described as theoretical sciences). **Since it is quite clear that if the divine belongs anywhere, it belongs in a nature** (*phusei*) **of this sort:** A somewhat unfortunate use of *phusis* to mean not a nature of the sort studied by a natural science but the sort or kind to which the causes of the evident divine things belong (A 1 980<sup>a</sup>21n).

#### Note 640

**The most estimable must be concerned with the most estimable genus:** See A 2 983<sup>a</sup>4–5n.

#### Note 641

**The theoretical are the more choiceworthy of the various sciences, and this of the theoretical:** “If some activities are necessary and choiceworthy because of other things, whereas others are intrinsically choiceworthy, it is clear that happiness must be classed as one of those that are intrinsically choiceworthy, not as one of those choiceworthy because of something else, since happiness lacks nothing but instead is self-sufficient” (NE X 6 1176<sup>b</sup>2–6); “If happiness is activity in accord with virtue, it is quite reasonable that it should be in accord with the one that is most excellent [= *sophia*]. . . . That it is contemplative activity we already said. . . . Moreover

we think that pleasure must be mixed in with happiness, and the most pleasant of the activities in accord with virtue is agreed to be the one in accord with theoretical wisdom (*sophia*). At any rate, philosophy seems to involve pleasures that are wondrous for their purity and stability, and it is quite reasonable that those who have attained knowledge should pass their time more pleasantly than those who are looking for it. Moreover, the self-sufficiency that is meant will belong most of all to contemplative activity. . . . [For] a theoretically-wise person, even when by himself, is able to contemplate, and the more wise he is, the more he is able to do so. He will do it better, presumably, if he has co-workers, but all the same he is most self-sufficient" (X 7 1177<sup>a</sup>12–<sup>b</sup>1). See also A 2 982<sup>b</sup>20–983<sup>a</sup>11.

#### Note 642

**We might raise a puzzle indeed as to whether the primary philosophy is universal or concerned with a particular genus and one particular nature (*phusin*):** The science of being qua being (or primary philosophy) must be universal, since it deals with all the beings as such. But an inductive survey of the sciences has grouped them into three sorts: natural, mathematical, theological. Apparently, then, the science of being qua being must be one of these. If so, it is apparently not universal, but deals with the special *physis* (as at 1026<sup>a</sup>20 an unfortunate use of the term) dealt with by whatever sort of science it turns out to be. Hence the puzzle.

#### Note 643

**Universal mathematics is common to all:** Many theorems in mathematics are special to some branch of it, such as arithmetic or geometry, but there are also "certain mathematical theorems of a universal character" (M 2 1077<sup>a</sup>9–10). Here is an example: "That proportionals alternate might be thought to apply to numbers qua numbers, lines qua lines, solids qua solids, and times qua times, as used to be demonstrated of these separately, although it is possible to show it of all cases by a single demonstration. But because all these things—numbers, lengths, times, solids—do not constitute a single named [kind] and differ in form from one another, they were treated separately. But now it is demonstrated universally: for what is supposed to hold of them universally does not hold of them qua lines or qua numbers but qua this [unnamed kind]" (APo. I 5 74<sup>a</sup>17–25). Nonetheless, the universality of the demonstration is open to challenge on the grounds that lines and numbers differ in genus. For "it is necessary for the extreme and middle terms in a demonstration to come from the same genus" (I 7 75<sup>b</sup>10–11), so that transgeneric demonstrations are ruled out: "it is impossible that what is shown should cross from one genus to another" (I 23 84<sup>b</sup>17–18). Hence "the why [that is, why the theorem about proportionals holds in the case of lines and of numbers] is different" (II 17 99<sup>a</sup>8–9), and so separate demonstrations seem to be needed in the case of each. Nonetheless, "qua such-and-such an increase in quantity" (99<sup>a</sup>9–10) the demonstration is the same, so that the theorem "holds in common of all quantities" (K 4 1061<sup>b</sup>19–21). For "while the genera of the beings are different, some attributes belong to quantities and others to qualities alone, with the help of which we can show things" (APo. II 32 88<sup>b</sup>1–3). But though the universal theorem holds of all quantities, it does so *by analogy*: "Of the items used in the demonstrative

sciences some are special to each science and others common—but common by analogy, since they are only useful in so far as they bear on the genus falling under the science. Proper—for example, that a line is such-and-such, and straight so-and-so. Common—for example, that if equals are taken from equals, the remainders are equal” (I 10 76<sup>37</sup>–41). Thus the kind to which lines, numbers, and so on belong, which is the ontological correlate of a theorem of universal mathematics, is not a first-order genus, but a second-order analogical unity—a quantity.

#### Note 644

**It will be universal in this way, namely, because it is primary:** This is Aristotle’s resolution to the puzzle. Natural, mathematical, and theological sciences or philosophies deal with beings of different “natures,” which together exhaust the beings and their starting-points and causes, and so must include those of the beings *qua* beings. The one that is primary among these must deal with the starting-points and causes that are prior to those of the others, so that those starting-points and causes too fall within its explanatory scope. Since together with its own starting-points and causes, these are all the ones there are, its explanatory scope is indeed universal—it includes the starting-points and causes of all the beings, and so of them *qua* beings. The primary starting-points and causes, however, are the immovable movers that are the starting-points and causes of the “divine beings that are evident.” But if “the divine belongs anywhere, it belongs in a nature of this sort”—which is the sort that theological science or philosophy is concerned with. Therefore, theological science or philosophy must be the universal science of being *qua* being. It is universal, though, not in dealing with a universal genus, for “being is not a genus” (APo. II 7 92<sup>14</sup>), but in the way that universal mathematics is. See A 4–5.

#### Note 645

**Since something is unconditionally said to be in many ways, of which one, we saw, is coincidentally:** The reference is to Δ 7. Coincidental being is discussed in E 2, 3; being as being true in E 4; being as what something is in Z and H, and potential being and active being in Θ.

**We must first say about the coincidental sort that there can be no theoretical knowledge (*theōria*) about it:** Compare K 8 1064<sup>15</sup>–1065<sup>6</sup>. To establish this Aristotle considers not just theoretical but also practical and productive sciences, which are the three sorts he recognizes (K 7 1064<sup>16</sup>–19, *Top.* VI 6 145<sup>15</sup>–16). But practical and productive sciences too have a theoretical component, since they involve a grasp by understanding of universal starting-points (Z 7 1032<sup>32</sup>–<sup>37</sup>). Notice the reference to *ta êthikês theōrias* (“theoretical knowledge of ethics”) at APo. I 33 89<sup>69</sup>.

#### Note 646

**There is nothing to prevent the house he has produced from being pleasant to some, harmful to others, beneficial to others:** To produce pleasant, harmful, or beneficial houses in a reliable way, a builder would have to know as a part of his craft what pleasure, harm, and benefit are, and how to bring them about. But this knowledge is no more a part of his craft than is knowledge of what happiness

is: “Thought by itself, however, moves nothing. But the one that is for the sake of something and practical does. Indeed, it even rules productive thought. For every producer produces for the sake of something, and what is unconditionally an end (as opposed to in relation to something and for something else) is not what is producible but what is doable in action. For doing well in action [= happiness] is the end, and the desire is for it” (NE VI 2 1139<sup>a</sup>35–<sup>b</sup>4).

**And from being distinct (one might almost say) from all other beings:** Being pleasant, harmful, or beneficial are not attributes that a house has insofar as it is a house. The same is true of being distinct from all other beings, which a house has not insofar as it is a house but insofar as it is a being, since every being is the thing it is and not another thing. Hence, just as the builder, insofar as he is a builder, does not, in knowing what a house is, know that it is pleasant, harmful, or beneficial, he does not know either that it is distinct from all other beings.

#### Note 647

**A geometer does not get a theoretical grasp on . . . whether a triangle and a triangle having interior angles equal to two right angles are distinct:** This is a topic for a philosopher dialectician of the sort mentioned at Γ 2 1004<sup>b</sup>1–3 and at 1026<sup>b</sup>15–21 below. If we say (1) a triangle  $\neq$  a 2R triangle (that is, a triangle having interior angles equal to two right angles), we are asked (for example, by a sophist), how it is that every triangle is a 2R triangle and vice versa. If we say (2) a triangle = a 2R triangle, he will substitute “2R triangle” for “triangle,” to get (3) a triangle = a 2R2R triangle. Repeated substitution of this sort results in “babbling (*adoleschein*),” or unending repletion of the same thing (SE 3 165<sup>b</sup>15–17, 13 173<sup>a</sup>31–<sup>b</sup>16).

#### Note 648

**Since “coincidental” is like “in name only”** (*hōsper gar onoma ti monon to sumbebēkos estin*): Literally: “the coincidental is, as it were, only a sort of name.”

#### Note 649

**That is why Plato was in a way not wrong when he classified sophistic as being concerned with what is not** (*to mē on*): “The sophist runs off into the darkness of what is not (*tou mē ontos*), which he has had practice dealing with, and he is hard to see because the place is so dark” (*Sph.* 254a4–6).

**When he classified** (*etaxen*): Aristotle uses the aorist here; the imperfect *eirēke* (“used to say”) at K 8 1064<sup>b</sup>29.

#### Note 650

**Whether musical and grammatical . . . are distinct or the same:** (1) Socrates is grammatical, that is, he can read and write (*Top.* VI 5 142<sup>b</sup>30–35). (2) Therefore, grammatical Socrates = Socrates. (3) Socrates is musical. (4) Therefore, musical Socrates = Socrates. (5) Therefore musical Socrates = grammatical Socrates. (6) Therefore, the musical = the grammatical. (7) Therefore, if the musical coincides with anything, so does the grammatical, and vice versa. (8) Coriscus is musical but not grammatical. (9) Therefore, the musical  $\neq$  the grammatical. (10) (9) contradicts (6). The flaw in the argument is step (6), which treats the fact that the musical

and the grammatical coincide in Socrates as entailing their (non-coincidental or necessary) identity ( $\Delta$  6).

**Whether . . . musical Coriscus and Coriscus are distinct or the same:** If (1) (a) Coriscus = (b) musical Coriscus, then by substitution of “musical Coriscus” for “Coriscus” in (b), we again get babbling. The problem here is with (1): “Likewise in the case of Coriscus and musical Coriscus—are they the same or distinct? For [the sophistical argument arises because] ‘Coriscus’ signifies a this something, whereas ‘musical Coriscus’ signifies a quality” (*SE* 22 178<sup>b</sup>39–179<sup>a</sup>2).

**If someone who was musical has come to be grammatical, he must also have been grammatical and come to be musical:** “Not everything that is has either come to be or is eternally (or always) so, as the sophists say, since someone musical who is grammatical is so without ever having become so or being so eternally” (*Top.* I 12 104<sup>b</sup>25–27; also *K* 8 1064<sup>b</sup>23–26). The argument is apparently this: (1) Socrates was musical and became grammatical. (2) Therefore, Socrates, being musical, is grammatical. (3) Therefore, Socrates, being grammatical, is musical. (4) Socrates has not always, being grammatical, been musical. (5) Therefore, it must be that Socrates, being grammatical, has become musical. (6) Therefore, being musical, Socrates became musical and, being grammatical, he became grammatical. (7) Therefore, Socrates was musical before he became musical and grammatical before he became grammatical. (8) But Socrates was not always or eternally either musical or grammatical.

#### Note 651

**With things that are in another way there is coming to be and passing away, but with things that are coincidentally there is not:** A substance A (a statue of Hermes) is the sort of thing that can come to be and pass away. For there is an underlying subject, the piece of marble of which A is composed, whose changing from not having the form of Hermes to having it constitutes A’s coming to be, and whose changing from having the form of Hermes to not having it constitutes A’s passing away. Pale A by contrast is a coincidental being. If it could come to be and pass away both its components, both A and B (the particular instance of pale that coincides with A), would have to be able to come to be and pass away. But B is not able to do this. For there is no underlying subject, analogous to the marble, whose change from not having to having the form of pale could constitute B’s coming to be, and none whose reverse change could constitute B’s passing away. To suppose otherwise would be to suppose that there was a particular instance of color C that was not an instance of pale at one time and was an instance of it at another. But there could be no such thing as C. An object like A can change color, but a color cannot change color. See also *I* 7 1011<sup>b</sup>29–1012<sup>a</sup>1.

#### Note 652

**Of the beings, some are . . . of necessity so:** See  $\Delta$  5 1015<sup>a</sup>33–<sup>b</sup>6.

**In the sense in which we say that it does not admit of being otherwise:** Identified at *K* 8 1064<sup>b</sup>34 as the sense relevant to demonstrations.

**While others are the way they are neither of necessity nor always but for the most part** (*hōs epi to polu*): “The contrary of what is *hōs epi to polu* is always said to be something that rarely occurs” (*Top.* II 6 112<sup>b</sup>10–11); “When something comes about always or *hōs epi to polu*, it does not do so coincidentally or by luck, but with what is natural it is always comes about that way provided there is no impediment” (*Ph.* II 8 199<sup>b</sup>24–26); “What is either universally or *hōs epi to polu* so is in accord with nature” (*PA* III 2 663<sup>b</sup>28–29). *Hōs epi to polu* is not equivalent in meaning, however, to the quantifier “most,” since “*hōs d’ epi to polu* all (*pantes*) crabs have the right claw bigger and stronger than the left” (*HA* IV 3 527<sup>b</sup>6–7). Instead, it seems to be a special type or grade of modality that is in between contingency and unconditional necessity: “from this of necessity this (‘from this’ either unconditionally or *hōs epi to polu*)” (*Ph.* II 7 198<sup>b</sup>5–6).

**This is starting-point and this the cause of the existence of the coincidental:** If A is B neither of necessity nor always but for the most part, it follows that “A is not B” must hold neither of necessity nor always nor for the most part, and so must hold coincidentally. See 1027<sup>a</sup>8–13.

#### Note 653

**If in the dog-days we have storm and cold, we say that it a coincidence, but not if we have stifling heat:** The dog-days are the sultry days of July and August, so-called because they were associated with the Dog Star (Sirius).

#### Note 654

**A gourmet cook, aiming to give pleasure, might produce something healthy:** Reading *τι ὑγιεινόν* with Ross for OCT *τινι ὑγιεινόν* (“health in someone”). The presupposition is that the end or goal intrinsic to gourmet cooking is pleasure not health: “the crafts of the perfumer and the gourmet chef do seem to be crafts of pleasure” (*NE* VII 12 1153<sup>a</sup>26–27).

#### Note 655

**Of other things there are sometimes capacities that are productive of them:** Reading *τῶν μὲν γὰρ ἄλλων ἐνίοτε δυνάμεις εἰσὶν αἱ ποιητικαί*. OCT brackets *αἱ* for deletion. The claim is that of things other than coincidental ones there are in some cases crafts or capacities that deal with them, and in others not.

#### Note 656

**And so the matter, which is capable of being otherwise than it for the most part is, will be the cause of the coincidental:** Here the matter is the underlying subject, such as the human, who is coincidentally pale and musical, because it does not follow from his essence or nature that he is either. But matter—that is, perceptible sublunary matter—in its proper sense of what is correlative with, and to varying degrees receptive of, form is also the cause of the coincidental more generally: “Nature tends, then, to measure the coming to be and passing away of animals by the regular movements of these bodies [the sun and moon], but nature cannot bring this about exactly because of the indefiniteness of matter, and because many starting-points exist which impede coming to be and passing away from being



according to nature, and often cause things to occur contrary to nature” (GA IV 10 778<sup>a</sup>4–9).

Note 657

**We must grasp this starting-point [when we ask] whether there is nothing that is neither always nor for the most part or whether this is impossible:** This is the starting-point and cause mentioned at 1026<sup>b</sup>27–31 and identified with matter at 1027<sup>a</sup>13–15. When we grasp it we see why, and not just that, the contingent exists.

Note 658

**Luck:** See K 8 1065<sup>a</sup>30–32.

Note 659

**These topics will have to be investigated later:** In A 6–8.

Note 660

**How else could one learn, or teach someone else?:** See A 1 981<sup>b</sup>10n.

Note 661

**The exceptions to this cannot be stated:** Because the exceptions are too many, various, and unpredictable to admit of formulation, as when a legislator cannot give a complete specification of what wounding someone with a weapon is, “owing to the unlimited number of cases presented, such as the size and sort of an iron instrument that may be used to inflict wounds—a lifetime would be too short to make out a complete list of these” (*Rh.* I 13 1374<sup>a</sup>26–<sup>b</sup>1).

Note 662

**That there are starting-points and causes that can come to be and pass away without coming to be and passing away is evident:** Coincidental things do not come to be or pass away (E 2 1026<sup>b</sup>22–24). The claim is that this must also be true of their causes.

**Since otherwise everything will be of necessity:** Compare K 8 1065<sup>a</sup>6–21.

Note 663

**In this way we shall come to what [attributes] belong to him now** (*eis ho nun hu-parchei*): Since we have come to think of causation as fundamentally linking events, we would say, “in this way we shall come to *what is happening now*.” If we think of an event as consisting in an attribute’s belonging to a substantial particular, we will be closer to Aristotle’s way of putting things. Thus a human, in his view, is an absolute starting-point of his deliberately chosen actions, so that it is his having certain attributes—having certain desires, certain states of character, and engaging in certain deliberation—that explains fully why his actions occur. In such cases, there are no causes more primitive than those (*NE* VI 2 1139<sup>a</sup>35–<sup>b</sup>5, quoted in *Δ* 1 1013<sup>a</sup>21n). Similarly, a craftsman, such as a builder, is an absolute starting-point or cause of his products. That is why Aristotle can conclude at 1027<sup>b</sup>11–12 that when we follow back a chain of causes we will come to a starting-point that has no prior cause.

## Note 664

**The presence of contraries in the same thing:** “What belongs to contraries is accidentally caused to pass away by the passing away of the contraries (for contraries do away with each other). But none of the contraries present in substances are caused to pass away coincidentally, since substance cannot be predicated of any underlying subject. And so it would be impossible for anything that has no contrary or in which its contrary is not present to be caused to pass away. For what would there be to cause it to pass away, if indeed things can only be caused to pass away by their contraries, and if such a contrary does not exist, whether generally or around there? Or is this in one way true and in another way not? For it is impossible for anything that has matter not to have a contrary somehow belonging to it” (*Long.* 3 461<sup>b</sup>1–12); “We might get a theoretical grasp on the cause of all these facts [about length of life] as follows. We must grasp that a living being is by nature moist and hot, and life also has such a nature, whereas old age is cold and dry as is a dead body. For it is evident that things are this way. But the matter of the bodies of animals consists of these: the hot, the cold, the dry, and the moist. Thus as they grow old they must become dry, which is why the moisture in them must not be too easily dried” (5 466<sup>a</sup>17–23); “Coming to be [for an animal] is its first participation—by means of heat (*en tō[i] thermo[i]*)—in nutritive soul; and life is the remaining of this participation. . . . Violent death or passing away occurs through the extinction or exhaustion of the heat (for passing away may occur through either of these causes), whereas natural death is the exhaustion of the heat coming about through length and completeness of time” (*Juv.* 24 479<sup>a</sup>29–<sup>b</sup>3).

## Note 665

**Matter, the for-the-sake-of-which, what set things moving:** The formal cause is omitted from the list because what happens coincidentally or by luck cannot have such a cause, since it cannot have the sort of demonstrative scientific explanation that begins with a definition of a form or essence (A 1 981<sup>a</sup>3n).

## Note 666

**They have to do with (*peri*) combination and division:** Reading *peri* with OCT. Ross and some mss. read *napà* (“depend on combination and division”). Compare: “Just as some intelligible objects (*noëma*) in the soul are neither true nor false, whereas others are already necessarily one or the other, so it is with voiced sounds too. For falsity and truth have to do with (*peri*) combination and division. Thus names and verbs by themselves—for example, ‘human’ or ‘pale’ when nothing further is added—are like the intelligible objects that are without combination and division, since so far they are neither false nor true. An indication of this is that even ‘goat-stag’ signifies something (*ti*) but not, as yet, anything true or false—unless ‘is’ or ‘is not’ (*to einai ê mê einai*) is added” (*Int.* 1 16<sup>a</sup>9–18).

**And together have to do with the allocation of a contradictory pair:** See Δ 7 1011<sup>b</sup>26–27.

## Note 667

**The way understanding things at the same time or separately come about is another story:** See Θ 10 1051<sup>b</sup>30–1052<sup>a</sup>4.

## Note 668

**What should be done to get a theoretical grasp on this way of being and not being:** “This way” refers to a sort of truth and falsity that, unlike the propositional sort discussed here, is in objects. See Δ 29 1024<sup>b</sup>18–19.

**Must be investigated later:** See Θ 10 1051<sup>a</sup>34–<sup>b</sup>5 (especially <sup>b</sup>2–3).

## Note 669

**Thought joins or subtracts:** Reading συνάπτει ἢ ἀφαιρεῖ ἢ διάνοια with Ross for OCT συνάπτει ἢ διαίρει ἢ διάνοια (“thought joins or divides”).

## Note 670

**Being coincidentally and being as being true do not make clear any nature of being as external (exō):** On the meaning of *exō*, see K 8 1065<sup>a</sup>24n.

## BOOK ZETA (VII)

## Note 671

**We distinguished earlier:** Δ 7.

## Note 672

**“Being” signifies the what-it-is:** See A 5 987<sup>a</sup>20n.

**And a this something:** See B 5 1001<sup>b</sup>33n.

**The other things predicated as these are:** See Δ 7 1017<sup>a</sup>23n.

## Note 673

**The substance (hê ousia):** See A 3 983<sup>a</sup>27n.

## Note 674

**Someone might indeed be puzzled about whether walking and being healthy and sitting is a being or not a being:** Reading ἕκαστον αὐτῶν ὃν ἢ μὴ ὄν with OCT and FP. Ross reads ἕκαστον αὐτῶν ὃν σημαίνει (“each of them signifies a being”).

## Note 675

**By its nature (pephukos) intrinsically a being:** Reading καθ’ αὐτὸ πεφυκός with Ross and FP. OCT brackets πεφυκός for deletion.

**It is the walking thing that is a being:** Reading τὸ βαδίζον τι τῶν ὄντων with FP for OCT τὸ βαδίζον τῶν ὄντων (“it is the walking thing that belongs among the beings”).

## Note 676

**This is the substance and the particular:** See M 10 1086<sup>b</sup>16–19.

## Note 677

**Not is something [else] (ou ti on) but is unconditionally (on haplôs):** The sitting thing is (or is a being) by being something else, namely, a human, but a human is not a being in this way, since—as a substance—it unconditionally is. Alternatively, *ou on ti* could mean “is not in a way,” but the contrast with *on haplôs* would come to much the same.

## Note 678

**Substance is primary in account, in knowledge, and in time. For of the other things that are predicated none is separable, but only this:** Here separability entails the three sorts of primacy. At Z 13 1038<sup>b</sup>27–29 the three sorts of primacy (or priority) entail separability.

**In time:** A is primary in time, if there is no B that is prior in time to it. Priority in time, elucidated in terms of separability in the next sentence, seems to be what Δ 11 refers to as priority “in nature and substance” (1019<sup>a</sup>1–4). What it calls “priority in time,” on the other hand, is a matter of one thing being earlier than another (1018<sup>a</sup>14–19), which it, in agreement with *Cat.* 12 14<sup>a</sup>26–28, refers to as “the strictest” sort of priority.

**In knowledge (*gnôsei*):** At Δ 11 1018<sup>b</sup>31 priority in account is one sort of priority in knowledge. At Θ 8 1049<sup>b</sup>16–17 the two are treated as equivalent, as at Λ 3 1070<sup>a</sup>30, Θ 2 1046<sup>b</sup>7 are account and knowledge.

## Note 679

**Of the various things that are predicated none is separable (*chôriston*), but only this:** (1) Walking and being healthy have just been characterized as “incapable of being separated,” on the grounds that there is some particular substantial underlying subject of which they are predicated (1028<sup>a</sup>20–31). Often, separability is associated with being such a subject: “The underlying subject is prior, which is why the substance is prior” (Δ 11 1019<sup>a</sup>5–6); “If we do not posit substances to be separated, and in the way in which particular things are said to be separated, we will do away with the sort of substance we wish to maintain” (M 10 1086<sup>b</sup>16–19). Similarly, not being separable is associated—as in the case of walking and being healthy—with being predicated of such a subject: “None of the other things is separable besides substance, for all of them are said of substance as of an underlying subject” (*Ph.* I 2 185<sup>a</sup>31–32). Being predicated of a substance—being an attribute—seems, then, to be a sufficient condition of not being separable. Moreover, not being separable seems itself to be a sufficient condition of being ontologically dependent: (1a) “All the other things are either said of the primary substances as subjects or in them as subjects. So if the primary substances were not, it would be impossible for any of the other things to be” (*Cat.* 5 2<sup>b</sup>3–6).

(2) Couched in terms of priority, what is attributed to primary substances in (1a) is *substantial* priority, or priority in nature, which Aristotle defines in two ways: (2a) “[t]hings are said to be prior in nature and substance, when it is possible for them to be (*einai*) without other things, but not the others without them” (Δ 11 1019<sup>a</sup>3–4); (2b) “Those things are prior in substance [to others] which, when separated, surpass [them] in being (*tô[i] einai hyperballein*)” (M 2 1077<sup>b</sup>2–3). Moreover, in a text apparently expressing an idea similar to (2b), the form of a matter-form compound is said to be “prior to the matter and more (*mallon*) of a being” (Z 3 1029<sup>a</sup>5–6). Since existence, like identity, does not come in degrees, the use of the verb *hyperballein* and the adverb *mallon* makes it difficult to understand *einai* (“being,” “to be”) as having an exclusively existential sense (T 1 1003<sup>a</sup>21n). At the same time, *einai* does seem to have some existential import, as it surely does

in (2c): "if everyone were well, health would be (*estai* = exist) but not sickness, and if everything were white, whiteness would be (*estai*) but not blackness" (Cat. 11 14<sup>7</sup>–10). It seems reasonable, therefore, to think that to be is to be a being of some sort, and that to be a being entails existing. To be a being, however, is to be either a coincidental being (the pale human) or an intrinsic being, something with an essence (the human). To be an intrinsic being, in turn, is to be either an intrinsic coincident (B 1 995<sup>b</sup>20n), a matter-form compound, or simply a substantial form (E 1 1025<sup>b</sup>28–1026<sup>a</sup>15). As identical to its tightly unified essence (Z 12 1037<sup>b</sup>10–27), a substantial form, is an intrinsic being of the highest order—a primary substance (11 1037<sup>a</sup>33–<sup>b</sup>4). A matter-form compound, by contrast, since it is never identical to its essence (1037<sup>b</sup>4–7), is an intrinsic being of a lower order (A 7 1072<sup>a</sup>30–32), since it is always a complex thing, a this in this (Z 5 1030<sup>a</sup>18), whose essence is complex in a structurally parallel way (10 1035<sup>b</sup>27–30). Similarly, an intrinsically coincidental being, while it follows from an essence, is still a complex of two intrinsic beings, one a substance with an essence, the other an attribute. For X to be more of a being than Y, or to exceed Y in being, we might reasonably conclude, is for it to be closer to a substantial form on this scale. It is, as we might put it, for X to more intrinsic a being than Y. Degrees of being are degrees of intrinsicity, then, not degrees of existence.

(3) Attributes depend for their existence on substance, but not on that of some particular substance, any substance that has them will do: white exists if something is white, but the something does not have to be Bucephalus. Hence the parallel claim about substances should not be that a substance can exist without any attributes, suggesting that substances are bare particulars, but that substances in general can exist whether or not attributes do. On an *ante rem* (or Platonist) theory attributes can exist uninstantiated by particulars. On an *in re* theory, like Aristotle's, they cannot. That is the message of (2c). Hence the ontological dependence of attributes—and the cognate ontological independence of substances—must be formulated differently by these theories. It seems, then, that if *in re* attributes were ontologically independent of substances, it could only be because they were instantiated by something else, since they cannot exist uninstantiated by particulars of some sort. This is the way we see Aristotle thinking in the following text: "Heat and straightness [and whiteness] can be present in every part of a thing, but it is impossible for all of it to be hot, white, or straight [and nothing else]. For then the attributes would be separated" (Long. 3 465<sup>b</sup>12–14). Whiteness would be separate from substance, notice, not if it existed entirely uninstantiated, but if it were instantiated by a being that was wholly and exclusively white. Such a being is obviously not an Aristotelian substance, but something more like the Platonic Form of whiteness, which does seem to be white and nothing else (Plato, *Phd.* 78d5–7). Aristotelian substances can exist, then, whether or not their attributes exist by being instantiated by something else. Attributes, on the other hand, cannot exist unless they are instantiated by Aristotelian substances, since such substances are (in Aristotle's view) the only ultimate subjects of predication. The separability of substance from attributes, on this way of looking at it, is entirely of a piece with their inseparability from it.

(4) The verb *chôrizein* derives from *chôra* ("place"), and means, "to separate, part, sever, or divide" things by causing them (roughly speaking) to be in separate (or disjoint) places (B 2 998<sup>17-19</sup>, K 12 1068<sup>26-27</sup>). Thus when Aristotle describes Plato as separating the Forms from perceptible particulars (M 4 1078<sup>30-34</sup>), the primary connotation is that of putting them in separate places: perceptible particulars are "here (*entautha*)," Forms are "over there (*ka-kei*)" (A 9 990<sup>34-991<sup>a</sup>1</sup>). For a Form is "a particular, they say, and separable" (Z 15 1040<sup>8-9</sup>) and "place is special to particular things, which is why they are separable by place" (N 5 1092<sup>18-19</sup>). Moreover, the fundamental objection Aristotle makes to such separable Forms is that they are an incoherent mixture of universals and of the particulars needed for their instantiation and existence: "They say that there is man-itself and horse-itself and health-itself, and nothing else—like those who introduce gods, but say that they are human in form. For those people were making the gods nothing but eternal human beings, and these are making the Forms nothing but eternal perceptibles" (B 2 997<sup>9-12</sup>); "They at the same time make the Ideas universal and contrariwise treat them as separable and as particulars . . . that this is not possible is a puzzle that has been gone through before" (M 9 1086<sup>32-35</sup>; also B 6 1003<sup>5-17</sup>). We might expect, therefore, as (4) implies, that the separability Aristotle accords to his own substances, but denies to attributes, would be the separability he denies to Platonic Forms: attributes are in substances around here not in substances (= Forms) that are elsewhere.

(5) Though separability is often characterized in terms of existential independence, in some cases this seems not to be required: "Of things that reciprocate as to implication of being (*einai*), that which is in some way the cause of the other's being might with perfect sense be called prior in nature. And that there are some such cases is clear. For there being a human reciprocates as to implication of being with the true statement about it: if there is a human, the statement whereby we say that there is a human is true, and reciprocally—since if the statement whereby we say there is a human is true, there is a human. And whereas the true statement is in no way the cause of the thing's being, the thing does seem in some way to be the cause of the statement's being true. For it is because of the thing's being or not being that the statement is called true or false" (*Cat.* 12 14<sup>b</sup>11–22). What lies at the bottom of separability, then, seems rather to be a sort of ontological independence that is causal or explanatory in nature. In any case, this is clearly what we find in the following texts: "This [nutritive soul] can be separated from the others, but the others cannot be separated from it, in the case of the mortal ones. This is evident in the case of plants, since they have no other capacity of soul" (*DA* II 2 413<sup>a</sup>31–<sup>b</sup>1; also I 1 403<sup>a</sup>10–16, <sup>b</sup>17–19); "Bodily parts . . . cannot even exist when they are separated. For it is not a finger in any and every state that is the finger of an animal, rather, a dead finger is only homonymously a finger" (Z 10 1035<sup>b</sup>23–25). For the inseparability of perceptual soul from nutritive soul, or a finger from an animal, is due to the causal relations that make the former dependent on the latter (E 1 1026<sup>a</sup>5–6n). Again, this makes the separability accorded to substances, but denied to attributes, the same as the separability denied to Platonic Forms. For the latter,

too, were intended to play an explanatory role: "the Forms are the causes of the what-it-is of other things, as *the one* is of the Forms" (A 6 988<sup>a</sup>10–11). See Introduction p. xlv.

(6) The separability of substance and the inseparability of attributes, while obviously essential to the account of both, is a special case of a more general phenomenon. For substance as form is not just separable from attributes but from matter as well. But if this is the sort of separability characterized in (1)–(6), it must be antisymmetric, so that form can exist apart from matter but not matter apart from form. In the case of the forms of matter-form compounds, whether their matter is perceptible or intelligible, this is clearly not the case: like snub, but unlike concavity, they cannot exist apart from matter (E 1 1025<sup>b</sup>28–1026<sup>a</sup>15). But in the case of other forms, those that are like concavity, it is possible (1026<sup>a</sup>15–16, A 6 1071<sup>b</sup>20). These are the primary intelligible substances, on which all others—including matter-form compounds—causally depend for their existence (Θ 8 1050<sup>b</sup>19) and order (K 2 1060<sup>a</sup>26–27). Matter, by contrast, cannot exist apart from form of some sort (N 2 1089<sup>b</sup>27–28), since without form it is not intrinsically anything at all (Z 3 1029<sup>a</sup>20–21).

(7) In (1) separability is tied to being a particular subject of predication, and so seems to be somehow logical or logico-linguistic in nature. (6), on the other hand, seems to tell a different sort of story, in which separability has more to do with causation and explanation than with logic. To bring the two together we need only reflect that Aristotle's logic is primarily a logic of science, and that whenever we have a subject-predicate proposition there is always a question as to why the predicate holds of the subject. The target of scientific explanation, indeed, is always just that: why does predicate P hold of subject S (Z 17 1041<sup>a</sup>10–11)? If P holds of S coincidentally, or by luck or chance, science has nothing to say about it (E 2 1026<sup>b</sup>3–5). There is no explanation. But if P is an intrinsic coincident of S, or if P is part of S's essence, or is S's essence, science does have something to say about it (A 1 981<sup>a</sup>3n(6–8)). What this implies is that the primary explanatory entities cannot themselves have a subject-predicate structure (Θ 10 1051<sup>a</sup>34–b5). They cannot be expressed as one thing said of another—they are not *thises-in-thises*. Instead, in comparison to things with such a structure, they are simple—forms, not matter-form compounds. The problem is—and it is one of the deepest in the *Metaphysics*—is how separable forms, which, like all forms, are universals (Z 11 1036<sup>a</sup>28–29), can indeed be primary subjects and this somethings—separable "in the way in which *particular things* are said to be separated." For Aristotle's answer we have to wait until M 10 1087<sup>a</sup>10–25.

**Of the various things (*allôn*) that are predicated:** As at A 8 990<sup>a</sup>3, *allos* almost certainly means not "other" here, but "various." For otherwise the implication is that substance is itself one of the things predicated of a subject. In that case, it would have to be a form of some sort. Since form has already been characterized as both separable and a this something (Δ 8 1017<sup>b</sup>24–26), and in some cases is predicated of matter (Z 3 1029<sup>a</sup>23–24), this is certainly not impossible. But the context, in which substance as subject is being contrasted with predicables, seems to tell against it.

**Separable (*chôriston*):** Verbals ending in *-ton*—of which *chôriston* is an example—sometimes have (1) the meaning of a perfect passive participle (“separated”) and sometimes (2) express possibility (“separable”). When *chôriston* is applied to substances I have translated it as “separable,” since this often seems to better capture its sense, especially that of its negative (see 1028<sup>a</sup>23–24). For things, such as the form and matter of a matter-form compound, are not just separated, in that they are always found together (Z II 1036<sup>b</sup>3–4)—they cannot be separated. Moreover, things that are separable, such as the understanding and the other parts of the soul, do not become actually separated until death (α 1 993<sup>b</sup>10n): “this [productive] understanding is separable (*chôristos*), impassive, and unmixed, being in substance an activity, [that is,] not sometimes understanding and at other times not. But, when separated (*chôristheis*), this alone is just what it is” (DA III 5 430<sup>a</sup>17–23).

#### Note 680

**Some people say [1] substance is one, [2] others more than one, [2a] some that is a limited number, [2b] others an unlimited one:** [1] The Milesians and the Eleatics; [2a] Pythagoreans, Empedocles and his followers; [2b] Anaxagoras and the atomists.

#### Note 681

**Natural bodies, such as fire, water, earth, and each thing of this sort:** Beyond the sublunary elements, earth, water, air, and fire, whose natural motion is rectilinear, there is a fifth element, ether or “primary body (*sôma prôton*)” (Cael. I 2 269<sup>b</sup>2–6, 3 270<sup>b</sup>19–25, Mete. I 3 339<sup>b</sup>25–27), from which the stars and other heavenly bodies are composed, whose natural motion is circular (Cael. I 2 268<sup>b</sup>24).

**The heaven and its parts:** That (many of) the parts of the heaven are substances is clear (A 8 1073<sup>a</sup>14). But is the heaven itself one? If the parts are of the same kind as the whole, Z 13 1039<sup>a</sup>3–4 tells us that the answer must be no. But it is not clear that they are of the same kind. In any case, the claim of the heaven to be not just an “agreed upon” substance (H I 1042<sup>a</sup>10–11) but a *correctly* agreed upon one seems not to be revoked or explicitly undercut by Aristotle. This has important bearing on the interpretation of the phrase “the nature of the whole” (A 10 1075<sup>a</sup>11n), since if the heaven is a substance it must have a nature (form) of its own that is beyond that of the individual natures of the substances that constitute it.

**The heaven:** See A 5 986<sup>a</sup>3n.

**But whether these are the only substances, or whether there are also others, or whether only some of these are but some others as well, is something that must be investigated:** See Z 16 1040<sup>b</sup>5–10, 17 1041<sup>b</sup>28–30, H 3 1043<sup>b</sup>21–23.

#### Note 682

**It seems to some people that the limits of body . . . are substances:** See A 9 992<sup>a</sup>20–22, B 1 996<sup>a</sup>12–15, 5 1001<sup>b</sup>26–1002<sup>b</sup>11.

#### Note 683

**Plato thought:** See A 6.



## Note 684

**Speusippus:** Speusippus of Athens was the son of Plato's sister Potone and Eurymedon of Myrrhinous. A member of the Academy, he became its head on Plato's death in 348/7 BC, and remained as such for eight years.

**He thought that there were even more substances:** See A 1 1075<sup>b</sup>37–1076<sup>a</sup>3, M 1 1076<sup>a</sup>21, 6 1080<sup>b</sup>14, 9 1085<sup>a</sup>31, N 3 1090<sup>b</sup>16–20.

**As well as starting-points for each sort of substance, one for numbers:** These were the one and plurality (M 9 1085<sup>b</sup>5, N 1 1087<sup>b</sup>5–12, 30, 5 1092<sup>a</sup>35–<sup>b</sup>1).

**Another for magnitudes:** The point and “a matter akin to plurality but distinct from it” (M 9 1085<sup>a</sup>31–32).

**Another for the soul:** Speusippus' views on the soul are unattested (Tarán, 47–48).

## Note 685

**Some say that the Forms and the numbers have the same nature:** Possibly Xenocrates. See A 1 1069<sup>a</sup>35, M 6 1080<sup>b</sup>21–23, 8 1083<sup>b</sup>1–3, 9 1086<sup>a</sup>5–6, N 3 1090<sup>b</sup>31–32.

## Note 686

**Whether there is any substance that is separate (*chôristê*):** See Z 1 1028<sup>a</sup>34n(4).

## Note 687

**The primary underlying subject seems most of all to be substance:** See Γ 3 1005<sup>a</sup>35n.

## Note 688

**The configuration of the form as it is presented to sight (*to schêma tês ideas*):** *Idea*, which in Plato's theory is a Form or Idea, is here the outline shape we can see something to have.

## Note 689

**If the form (*eidos*) is prior to the matter and (*kai*) more of a being (*mal-lon on*), it will also be prior to what is composed of both of them, for the same reason:** “Those things are prior in substance [to others] which, when separated, surpass [them] in being (*tô[i] einai hyperballei*)” (M 1 1077<sup>b</sup>2–3). Thus if form is more of a being than matter, it surpasses matter in being, and is prior in substance to it. *Kai* is epexegetic, in other words, so that what follows it identifies—the otherwise mysterious—type of priority referred to in what precedes it. The reason that the form is prior in substance to the matter or the compound is that it is more of an intrinsic being than either of them (Z 1 1028<sup>a</sup>34n(2)). For as the subsequent argument will show, matter is not intrinsically anything at all (1029<sup>a</sup>20–21), while the compound, as involving the form, is posterior to it (1029<sup>a</sup>30–32).

## Note 690

**The matter alone must appear to be substance for those who investigate in this way:** One bad consequence, about to be mentioned, is that matter has no intrinsic attributes, another is that all attributes become coincidental ones, so that substance and essence are done away with (Γ 4 1007<sup>a</sup>20–23).

Note 691

**To be a something (ti):** *Ti* here, and at 1029<sup>a</sup>24, is an abbreviated form of *tode ti*. **By matter I mean that which, intrinsically, is neither said to be a something, nor some quantity, nor anything else by which being is given definition:** The matter referred to is part of the thought experiment under discussion in which the ultimate subject of predication is isolated by a process of stripping away attributes and dispositions from the substance to which they belong—a thought experiment alienated onto thinkers other than Aristotle by the phrase “for those who investigate in these ways” and later by the phrase “for those who try to get a theoretical grasp on things in this way” (1029<sup>a</sup>26–27). Nonetheless, Aristotle might himself seem to be committed to an intrinsically featureless matter of this sort—traditionally thought to be what *prôtê hulê* refers to—both by (1) his own use of the term *prôtê hulê* and (2) by his account of the way in which the elements earth, water, air, and fire are transformed into each other, since this seems to require an underlying subject of such a sort.

(1) The term *prôtê hulê* is used at (a) *Ph.* II 1 192<sup>a</sup>29, where it is a thing’s matter-based nature, and so not featureless; (b) *GA* I 20 729<sup>a</sup>32, where the female menses is said to be like it because it provides the matter for the embryo not the form (*Z* 9 1034<sup>a</sup>33–<sup>b</sup>1n); (c) *A* 4 1015<sup>a</sup>7–10, where, as in (a), it is a thing’s matter-based nature, which could be determined by water “if all meltable things are water”; (d) 3 1014<sup>b</sup>32, where it is the matter from which a thing is first made; (e) 6 1017<sup>a</sup>5–6, where it is contrasted with ultimate matter and seems to have the same reference as in (d); *H* 4 1044<sup>a</sup>23, where it is again contrasted with ultimate matter and seems again to have the same reference as in (d); *⊙* 7 1049<sup>a</sup>24–27, where, as in (c), fire (again not featureless) would be *prôtê hulê* if other elements were composed of it, but not of anything else (a similar story is told in greater detail in *Ph.* II 193<sup>a</sup>9–28). It is clear from this survey that the term *prôtê hulê* never refers to featureless matter.

(2) Better evidence for a commitment to featureless matter is provided by *Ph.* I 9 192<sup>a</sup>25–<sup>b</sup>1, which uses the cognate term *proton hupokeimenon*: “In one way it [the matter] passes away and comes to be, but in another it does not. As that in which [the form is] it does intrinsically pass away (for in what passes away the lack [of form] is present), but as a potentiality it does not intrinsically pass away, but cannot either pass away or come to be. For if it came to be, there would have to be some primary underlying subject (*proton hupokeimenon*) from which, as a component, it came to be. But this is the nature itself (for by matter I mean that primary underlying subject in each case, from which, as a component, something non-coincidentally comes to be). So it would have to be before it had come to be. And if it passed away, this is what it would ultimately arrive at, so it would have passed away before it had passed away.” This text, with its focus on change, provides a nice segue into (3).

(3) The elements earth, water, air, and fire, which are by definition the most primitive of sublunary bodies, can nonetheless change into one another (*Cael.* III 6 305<sup>a</sup>31–32) in a way determined by their ultimate differentiae—hot, cold, wet, dry (*A* 8 989<sup>a</sup>16n). If elements are adjacent, so that like earth and water, they share

a differentia, transformation occurs when one of the differentia masters its contrary (GC II 4 331<sup>27-30</sup>). Suppose, then, that earth (E) is first transformed into water (W), then into air (A), then into fire (F), so that m (the underlying subject requisite for all change) is E at  $t_1$  and W at  $t_2$  and A at  $t_3$  and F at  $t_4$ . Since m underlies all elemental transformation, it cannot have any of the ultimate differentiae as an intrinsic attribute: if it did, it would not be able to lose them. But because these differentiae are the ultimate ones, there are no others m can possibly have (II 1 329<sup>10-13</sup>). So it must have these differentiae, but not in the same way as the elements themselves (329<sup>24-35</sup>). Thus while fire is essentially or intrinsically hot, m, while it may in fact be hot, must also be potentially cold, and so must be hot only coincidentally. For matter is "that which, primarily and intrinsically, is *potentially*" hot, cold, and the rest, without being any of them intrinsically or actually (A 4 1070<sup>12-13</sup>). It seems, then, that m must be featureless matter.

However, if m is to underlie elemental transformation, a numerically identical portion or quantity of it must persist through the transformation: "The thing, whatever it is, that underlies [the transformation of the elements into one another] is the same, although it is not the same in being" (GC I 3 319<sup>3-4</sup>). But because it seems to possess none of the ultimate contrary differentiae intrinsically, such a portion of featureless matter seems to impose no constraints whatsoever on element transformation. So, at the elemental level (and hence on up), anything could come from anything. But this Aristotle rules out: "Our first point, then, must be that no being whatever is by nature such as to do or suffer any random thing by dint of any random thing, nor does anything come to be from just anything, unless we take a coincidental case" (Ph. I 5 188<sup>31-33</sup>).

Since elemental transformation is not in fact indiscriminate but is constrained by the causal relations holding between the ultimate differentiae, m's defining potentialities must themselves be constrained by these causal relations. That is why Aristotle can simultaneously think that the elements come to be from *protê hulê*, and that they come to be from each other: "Since the elements cannot come to be either from what is bodiless [such as, a mathematical object] or from some other sort of body, the remaining possibility is that they come to be from each other" (Cael. III 6 305<sup>31-32</sup>). What an element comes from, then, is another element, but what underlies the transformation of one into the other is *protê hulê*, which is not a body separate from the elements, and has no essential or intrinsic attributes besides the potentialities determined by the causal relations between the ultimate differentiae.

Normally, of course, a thing's potentialities or dispositional properties are based in its actual or categorical properties, as table salt's solubility in water is based in its molecular structure. But when we get down to ultimate components, there may be no base of this sort, as may be true, for example, in the case of mass or gravitational attraction. At that point, what we confront are dispositions or potentialities that are simply brute. All we can say is that m is something that (i) when coincidentally cold and dry (earth) has the potentiality to become cold and wet (water), and (ii) when coincidentally cold and wet (water) has the potentiality to become hot and wet (air), and (iii) when coincidentally hot and wet (air) has the potentiality to

become hot and dry (fire), and (iv) when coincidentally hot and dry (fire) has the potentiality to become cold and dry (earth). The higher-order disposition that *m* possesses to behave in these four ways but not in others shows that it is not a parcel of featureless matter, which is dispositionless and in all other ways indefinite. The causal continuities exhibited across the four ways explain why *m* is the same thing throughout them.

Overall, then, there seems to be no compelling reason to think that the intrinsically featureless matter that is part of the thought experiment is something that Aristotle himself needs or uses. In fact, as the last sentence in the paragraph (1029<sup>a</sup>23–26) will make clear, it is something he rejects as incoherent. We might ask ourselves, in any case, how something intrinsically featureless, and so lacking an essence, a what-it-is, or a definition, could possibly be primary in knowledge, as substance is required to be (Z 1 1028<sup>a</sup>33).

#### Note 692

**While the other things are predicated of the substance, this is predicated of the matter:** The matter is the matter *m* that remains after all the attributes and capacities have been thought-experimentally stripped away. So we must think of *m* as concrete rather than abstract, something like an unbounded spatial region that is or was “given definition” (1029<sup>a</sup>18) by these attributes and capacities. What is predicated of *m* is substance, *S* (the referent of “this”). Within the confines of the experiment, *S* is *m*. But *m*, as precisely the ultimate subject of predication, cannot now be *S*, since *S* is predicated of it. In fact, what *S* is, is indicated at 1029<sup>a</sup>15–16: it is “the primary thing,” *whatever it is*, to which the attributes and capacities belong. In other words, it is what we are at this juncture still looking for. And what will become clear is that there is no general answer to what this primary thing is, since if we select those attributes and capacities that constitute a form, they (or it) will be predicated of matter (H 2 1043<sup>a</sup>5–6, 3 1043<sup>a</sup>30–32, © 7 1049<sup>a</sup>34–36), but if we select others, they will be predicated of a this something (Z 13 1038<sup>b</sup>4–6). And a this something, in turn, may be either a particular compound of matter and form or a certain sort of form (B 5 1001<sup>b</sup>32n).

#### Note 693

[1] **The last thing [in this series] will not be intrinsically something, or a quantity, or anything else—**[2] **nor indeed is it the denials of these, since** [3] **they too belong to it coincidentally:** The featureless matter *m* of the thought experiment, [1] tells us, is not intrinsically any predicable in any category, while [2] tells us that it is not intrinsically the denials of these either. Then [3] makes explicit the obvious conclusion that all of *m*'s predicables belong to it, or are said of it, coincidentally. But that is something Aristotle thinks is impossible: “If everything is said coincidentally, there will be no primary thing that they are said of, if a coincident always signifies a predication of some underlying subject. Hence it is necessary for predication to go on without limit; but that is impossible, since no more than two things can be combined in predication. For a coincident does not coincide with a coincident, unless it is because both coincide with the same subject” (T 4 1007<sup>a</sup>33–<sup>b</sup>4). Made specific to *m* the thought is this. Suppose that  $P_1 \dots P_n$  are

all of *m*'s predicables. Since each of them is a coincident, each must be predicated of some underlying subject, so that  $P_1$  is predicated of  $S_1$ ,  $P_2$  of  $S_2$ , . . .  $P_n$  of  $S_n$ . What must next be shown is that  $S_1 = S_2 = \dots = S_n = m$ . But if *m* is not intrinsically anything, there is nothing that it intrinsically is—nothing to which it is intrinsically identical. Hence there is no way to show that each of  $P_1 \dots P_n$  belong to the same subject *m*. What we have instead is  $P_1 \dots P_n$  all coinciding with each other, which is impossible in Aristotle's view.

#### Note 694

**But this is impossible. In fact (*gar*) . . .** I take the impossibility to have already been established by what has gone before, and so understand *gar* not as giving the grounds for the impossibility—as it would if it were translated as “for” or “since”—but as stating a further fact that adds to those grounds.

**Both separability and being a this something seem to belong most of all to substance, and, because of this, the form and the thing composed of both would seem (*doxeien an*) to be substance more than the matter is:** That this somethingness and separability belong to the compound of matter and form is readily intelligible. After all, it is such compounds—Socrates, Bucephalus—that are primary substances in the *Categories*, in part because they are separable this somethings (Γ 3 1005<sup>a</sup>35n). ‘That a form is a this something may be a more intuitive view than we might initially think (Z 10 1035<sup>a</sup>8n), but that it is separable is much harder to see, and has already been acknowledged to be so (Z 1 1028<sup>b</sup>31–32). For the moment, then, all that is claimed is that form *would seem* to be substance more than the matter is.

#### Note 695

[1] **The substance composed of both matter and form is posterior and evident.**

[2] **And the matter too is in a way (*pōs*) evident:** Start with [2]. If the matter referred to in it is the intrinsically featureless matter *m* of the thought experiment, it is difficult to see how it could be characterized as “in a way evident,” since far from being evident, it leads to impossibility and incoherence. By the same token, the composite substance referred to in [2] cannot be one that has *m* as its material component, since otherwise it would not be evident either. *Prima facie*, then, we have left the thought experiment behind and returned to familiar cases: matter is, for example, this bronze, and the substance composed of both matter and form is, for example, this brazen statue (1029<sup>a</sup>3–5).

#### Note 696

**For learning comes about for all in this way—through things by nature less knowable toward ones that are more knowable:** “We must indeed start from things that are knowable. But things are knowable in two ways, since some are knowable to us, some unconditionally. So presumably we should start from things knowable to us” (NE I 4 1095<sup>b</sup>2–4). Also A 2 982<sup>a</sup>23–25.

#### Note 697

**Just as with things in the sphere of action (*en tais praxesi*), the work is to begin from things that are good for each particular person and make things that**

**are wholly good good for each particular person:** The phrase *en tais praxesi* is used at NE II 2 1104<sup>a</sup>3–4 to describe the practical sphere with which ethics is concerned. Thus the comparison here is the inverse of the one given there: “Since, then, the present work is not undertaken for the sake of a theoretical science, as our others are (for we are engaging in the investigation not in order to know what virtue is but in order to become good people, since otherwise there would be nothing of benefit in it), we must investigate what relates to actions, that is, in what way they are to be done” (1103<sup>b</sup>26–30). The “work” referred to is thus the work of the ethicist or political philosopher. The things that are “wholly good” are those that are unconditionally so: “Since an unjust person is greedy, however, he will be concerned with goods—not with all of them but with those that are matters of good and bad luck, which are always good, unconditionally speaking, but for this or that person, not always so. (These are the ones we humans pray for and pursue. But we should not. Instead, we should pray that unconditionally good things will also be good for us)” (V 1 1129<sup>b</sup>1–6).

Note 698

**The things that are knowable and primary for particular groups of people are often only slightly knowable and have little or nothing of the being (*tou ontos*) in them:** *Tō on* (genitive: *tou ontos*) could be equivalent in meaning to “reality” or it could be the being that the knowledge in question is of.

Note 699

**{For it advances the work . . . through the former}:** This paragraph follows Z 4 1029<sup>b</sup>13 (“we must get a theoretical grasp on it”) in the mss.

Note 700

**Since at the start we determined in how many ways we define substance:** At Z 3 1028<sup>b</sup>33–1029<sup>a</sup>2.

**And of these one seemed to be the essence (*to ti ên einai*):** See A 3 983<sup>a</sup>25n.

**We must get a theoretical grasp on it:** Z 3 1029<sup>a</sup>32–34 leads us to expect an investigation of the sort of form involved in perceptible substance. Instead Z 4 begins with an investigation of the apparently different topic of essence. The reason for the apparent switch is probably this: Perceptible substances are essentially compounds of perceptible matter and form. So this fact about them must be reflected in the structure of their essences—something we have already been alerted to at E 1 1025<sup>a</sup>28–1026<sup>a</sup>6. But as with the essences, so with their definitions or accounts, which must make clear that these are “a this in this”—that is to say, this form in this sort of matter (Z 5 1030<sup>b</sup>18, 11 1036<sup>b</sup>21–32). Essence is, as we might say, the road—the more familiar road—to their sort of form. Form is the target; essence the better known road to it.

Note 701

**First let us say some things about it in a logico-linguistic way (*logikôs*):** (1) The adjective *logikos* (which occurs at Γ 3 1005<sup>b</sup>22) is used to distinguish a set of propositions and problems from those belonging to natural science or ethics: “Propositions such as this are ethical—for example, whether one should obey our parents

or the laws, if they disagree. *Logikos*, whether contraries belong to the same science or not. Natural scientific, whether the cosmos is eternal or not. And similarly for the problems" (*Top.* I 14 105<sup>b</sup>21–25). Since the question about a science of contraries is a philosophical one (B 2 996<sup>a</sup>18–21), *logikos* problems overlap with philosophical ones. At the same time, "if an argument depends on false but reputable beliefs, it is *logikos*" (*Top.* VIII 12 162<sup>b</sup>27), suggesting that *logikos* arguments overlap with dialectical ones, since both may rely on reputable beliefs (*endoxa*) or—more-or-less equivalently—on things said (*legomena*) about the topic (Γ 2 1004<sup>b</sup>17n). Indeed, the question about a science of contraries is itself identified as one for dialectic (M 4 1078<sup>b</sup>25–27).

(2) When Plato, unlike previous thinkers, is accorded a share of dialectic it is due to his investigation of *logoi* or accounts (A 6 987<sup>b</sup>31–33), which he almost always undertook through staged Socratic conversations, whose aim was to discover the correct definition (M 4 1078<sup>b</sup>23–25) of what something essentially or intrinsically is, or is itself-by-itself (*auto kath' hauto*)—the "itself" in the name of a Form probably stems from its being the ontological correlate of such a definition (B 2 997<sup>b</sup>8–9n). One core meaning of *logikos*, in fact, relates it to conversation and speaking, while another relates it to reason—the *logikai aretai* are the virtues of reason or thought (NE II 8 1108<sup>b</sup>9–10). When we ask *logikôs* (adverb) why it is that these bricks and stones are a house, what we are asking for is a formal cause or an essence (Z 17 1041<sup>a</sup>26–28), which is presumably why a deduction of the essence is a *logikos sullogismos* (*Apo.* II 8 93<sup>a</sup>15).

(3) When dialecticians are contrasted with natural scientists it is on the grounds that "the scientist gives the matter, whereas the dialectician gives the form and the account" (*DA* I 1 403<sup>b</sup>1–2)—again associating dialectic with proceeding *logikôs*. The dialectician proceeds *logikôs*, the natural scientist *phusikôs*—looking to matter but also to form, when the relevant essence requires it (E 1 1026<sup>a</sup>5–6). So to proceed in a strictly *logikôs* way when there is empirical evidence bearing on the subject is bad scientific practice: "It seems that the knowledge of the what-it-is is not only useful for getting a theoretical grasp on the causes of the coincidents connected to the essences [= intrinsic coincidents] . . . but also, conversely, knowing these coincidents contributes in great part to knowing the what-it-is. For when we can give an account of the way either all or most of these coincidents appear to be, we will then be able to speak best about the essence. For the starting-point of all demonstration is [the definition of] the what-it-is, so that insofar as definitions do not lead us to know the coincidents, or fail even to facilitate a likely conjecture about [how to demonstrate] them, it is clear that they have all been stated in a dialectical and empty way" (*DA* I 1 402<sup>b</sup>16–403<sup>a</sup>2).

(4) Before we start defining essences *logikôs*, then, we should have intimate knowledge of the empirical data that they are supposed to explain: "What causes our inability to take a comprehensive view of the agreed upon facts is lack of experience. That is why those who dwell in more intimate association with the facts of nature are better able to lay down starting-points that can bring together a good many of these, whereas those whom many arguments have made unobservant of the facts come too readily to their conclusions after looking at only a

few facts" (GC I 2 316<sup>a</sup>5–10). Thus a frequent criticism of Plato and the Platonists is that in proceeding *logikôs* they leave the earth and the world of facts too far behind and proceed at too abstract and general a level (A 2 987<sup>b</sup>29–988<sup>a</sup>7, A 1 1069<sup>a</sup>26–28).

(5) When the perceptual data are scarce, however, it is still possible to make some scientific headway. Astronomy is a case in point. Our theoretical knowledge of the heavenly bodies is relatively slight, "since as regards both those things on the basis of which one would investigate them and those things about them that we long to know, the perceptual appearances are altogether few" (PA I 5 644<sup>b</sup>25–28). There are many puzzles in astronomy, therefore, about which we can do little but conjecture, since "where things not apparent to perception are concerned, we think we have adequately shown our case to be in accord with reason if we have brought things back to what is possible, given the available appearances" (Meteor. I 7 344<sup>a</sup>5–7). To become a "little less puzzled" in areas like these is—until further perceptual data becomes available—the most we can hope for (Cael. II 12 291<sup>b</sup>24–28).

(6) In the current context—turning now to it—what exactly is it to proceed *logikôs* and what does proceeding in that way contrast with? The topic to be discussed *logikôs* is essence, with which *logikôs* is again associated at Z 17 1041<sup>a</sup>26–28—a topic that Plato focused on and with whom proceeding in that way is particularly associated. When *logikôs* is used for the third time in Z (at 4 1030<sup>a</sup>25) it is to characterize a patently dialectical remark. It is reasonable to conclude that (1) and (2) are the aspects of proceeding *logikôs* that are most clearly in play.

(7) A finish is decisively put to the discussion of essence at Z 11 1037<sup>a</sup>21–22 and its results summarized. However, "let us say some things about [essence] in a logico-linguistic way" can hardly be taken to cover the entire discussion up to that point. Instead, we should look to Z 4 1030<sup>a</sup>27–29—especially since it follows immediately upon the use of *logikôs* at 1030<sup>a</sup>25. For it both refers to an end having been reached to the discussion of "what is said (to *legomenon*)" about essence on the basis of what things are said to be intrinsically and draws a distinction between such a discussion and one focused on "the way the thing actually is." At the same time, Z 5–6 continue to speak about what things are (or are said to be) intrinsically, so that they might reasonably be seen as still being within the ambit of Z 4, and continuing to discuss topic relevant to it, even if not in terms of the things said about essence. In Z 7–9, the investigation no longer proceeds by looking to what things are said to be intrinsically, but looks instead to the role of form in the matter-form compounds that are the subject matter of *phusikôs* investigations. (What is intrinsic is mentioned six times in Z 4; three times in each of 5 and 6; not at all in 7; once in 8 in relation to Platonism; once in 9, in regard not to essence but to intrinsic causes; twice in 10, but in regard to the topic of matter being intrinsically unknowable; twice in 11, one (1037<sup>a</sup>21–22) being a back reference to 4; not at all in 12–13; once in 14, again in relation to Platonism (1039<sup>a</sup>30); and not at all in 15–17.)

(8) It is quite true that primary philosophy, as the *science* of being qua being, has starting-points of its own (E 1 1026<sup>a</sup>29–31) and that these are pure forms entirely



separate from matter of any sort (A 6 1071<sup>b</sup>5–22, 7 1073<sup>a</sup>3–5). But the investigation of form in matter-form compounds in Z 7–9 is a stepping-stone to these pure forms and is billed explicitly as such (3 1028<sup>a</sup>33–<sup>b</sup>12). That is why proceeding in a non-*logikôs* way even in primary philosophy can consist, as in (3), in proceeding *phusikôs*. (4) Empirical evidence is a different issue, and it is a noteworthy aspect of Aristotle's discussion, particularly in A 3–9 and in E 1, that it consists of an inductive review of what sciences are actually like and what sorts of explanations they actually give. *Direct* empirical evidence, as in (5), is a different issue again, and it might well be that here primary philosophy is in something of the same boat as astronomy, forced to proceed *logikôs* for want of the evidence needed to proceed in some other way.

#### Note 702

**The being (*einai*) for you is not the being for musical:** See Γ 4 1006<sup>a</sup>33–34n.

#### Note 703

**Why?:** Reading διὰ τί with FP.

#### Note 704

[1] **The account in which the thing itself (*auto*) is not present, but [2] it itself is said (*legonti auto*), this is the account of the essence for each thing:** A is an account of O. [1] tells us that O cannot then be present in A. Since very few objects are the sorts of things that could be present in an account in the first place, [1] is perhaps best understood as ruling out circular accounts. What cannot be in the account is the very thing the account is of, since its presence would make the account circular. In [2] it is less *legein* than *autos* that is doing the work. A is an account of O's essence when O itself—and not O plus something else—is said or expressed in it.

#### Note 705

**There are composites from the other categories too, for there is some underlying subject for each:** See A 3 1070<sup>b</sup>16–21, N 1 1089<sup>b</sup>27–28.

#### Note 706

**From an addition:** See M 3 1078<sup>a</sup>11n on exactness.

#### Note 707

**In one case what is being defined is [1] said to be by being added to another thing . . . ; in the other case, what is being defined is [2] said to be by another thing not being added to it:** Reading τὸ δὲ τῷ ἄλλῳ αὐτῷ οὐ with FP in [2]. In the first case, a simple definiendum (pale) is defined by a complex definiens (pale + human); in the second an apparently simple but actually complex definiendum (cloak = pale + human) is defined by a simple definiens (pale). In [1] what is added to is the definiens; in [2] it is the definiendum. [1] is described as not telling us what pale intrinsically is “from an addition,” because the definiens, which does the non-telling, contains an addition. [2] is described as not telling us what pale intrinsically is “by another thing not being added to it,” because in this case nothing

is added in the definiens. At 1030<sup>a</sup>33, [2] is characterized in terms of subtraction, because in the definiens something is subtracted from the definiendum.

Note 708

**The pale human is indeed something pale in that case, but not, surely, what being for pale was** (*ou mentoi ti ên [einai] leukô[i] einai*): (1) Cloak signifies pale human. (2) Cloak is defined as pale. (3) Therefore, pale human is defined as pale. (4) Therefore, the being for the pale human = the being for pale. (5) But this is false.

Note 709

**For the essence is just what** (*hoper*) **something is**: Reading ὅπερ γάρ τί ἐστι τὸ τί ἦν εἶναι with FP for OCT ὅπερ γάρ τὸδε τί ἐστι τὸ τί ἦν εἶναι (“for the essence is just what is a this something”). On *hoper*, see Γ 2 1003<sup>b</sup>33n.

Note 710

**If indeed the “this” (to tode) belongs only to substances**: A substance is a this something. The “something” (*ti*), or generalizing component, belongs to things other than substances: pale is something, as is noon. But the “this” (*tode*), or particularizing component, belongs only to substances. See B 5 1001<sup>b</sup>33n.

Note 711

**And so there will be an essence only for those things whose account is a definition**: On the assumption that, at any rate in the strict sense, only substances have definitions (1030<sup>b</sup>5–6, Z 12 1037<sup>b</sup>25–26).

Note 712

**Primary things are those that are said not by way of saying one thing of another**: The primary things (*ta prôta*) in the wholly unconditional sense are the primary substances (K 1 1059<sup>a</sup>33–34), and of these, the most primary is the one that is simple and an activity (Λ 7 1072<sup>a</sup>31–32). Consequently, it has no matter (or no reference to matter) in its essence (6 1071<sup>b</sup>19–21, 8 1074<sup>a</sup>35–36). Unlike the essences of matter-form compounds, therefore, which have a structure like that of the compounds themselves (Z 11 1037<sup>a</sup>9–10), its essence is not a compound of this form in this matter, both taken universally (5 1030<sup>b</sup>14–20). Equivalently, in its essence the activation or form is not predicated or said of anything else, in the way that it is predicated or said of the matter in matter-form compounds (H 2 1043<sup>a</sup>5–6), and so in their similarly structured essences. That is why it is said or expressed “not by way of saying one thing of another” (Θ 10 1051<sup>b</sup>17–1052<sup>a</sup>4). It is for this reason, too, that the primary things are what the most exact science—theoretical wisdom—is concerned with (A 2 982<sup>a</sup>25–26n). For, as the starting-points of unconditional demonstrations (Δ 5 1015<sup>b</sup>8–9), they are the primary starting-points and causes (A 2 982<sup>b</sup>1–4), so that “if they were not, nothing would be” (Θ 8 1050<sup>b</sup>19).

Note 713

**Hence the essence will belong to things that are species of a genus and to nothing else**: See Z 12 1038<sup>a</sup>5–26.

## Note 714

**Species of a genus seem not to be said by way of participation (*kata metochên*) and by way of being an attribute (*kata pathos*) or in a coincidental way (*hôs sumbebêkos*):** Aristotle sometimes uses the verb *metechein* in a somewhat technical sense in which  $T_1$  participates in  $T_2$  just in case  $T_1$  admits of the account of  $T_2$ : “Participating (*metechein*) is defined as admitting the account of what is participated in” (*Top.* IV 1 121<sup>a</sup>11–12). Here however *kata metochên* seems to be used in a looser sense, illustrated at *Z.* 11 1037<sup>b</sup>14–21, in which  $T_1$  participates in  $T_2$  just in case  $T_2$  is truly predicable of  $T_1$ , and so may be an attribute, even a coincidental attribute of it.

**Species of a genus seem (*dokei*) not to be said in these ways:** If  $S$  is a species of matter-form compounds,  $T_1$  is matter,  $T_2$  is form, and  $T_3$  is said of, or predicated of,  $T_1$  (*Z.* 10 1035<sup>b</sup>27–30, 11 1037<sup>a</sup>5–7). Since the matter  $\neq$  the form, these are cases in which one thing is said of another. Nonetheless, they are not cases in which  $T_1$  merely participates in  $T_2$ , since matter and form, though distinct, are potentially one (*H.* 6 1045<sup>a</sup>20–33).

## Note 715

**We must, then, also investigate how we should speak about each of them, but not more than how the thing in fact is:** “Our account will be adequate if its degree of perspicuity is in accord with its subject matter. For we must not look for the same degree of exactness in all accounts, any more than in all products of the crafts” (*NE.* I 3 1094<sup>b</sup>11–14).

## Note 716

**Just as what is not scientifically known is scientifically known:** By subtracting “not.”

## Note 717

**(What is correct, surely, is that they are said [to be] . . . with reference to one thing):** See *Γ.* 2 1003<sup>a</sup>34–<sup>b</sup>10.

## Note 718

**A definition of this sort . . . is of something that is one—not by continuity, like the *Iliad*, or by being tied together, but one in one of the ways in which things are said to be one:** In *Δ.* 6, (1) ways of being coincidentally one are distinguished from (2) ways of being intrinsically one. It is clear that Aristotle means at a minimum to be speaking about (2) here. Being one because continuous or because tied together, however, are ways of being intrinsically one (1015<sup>b</sup>36–1016<sup>a</sup>1), so that “one in the ways in which things are said to be one” cannot refer just to (2). What it means to refer to is clear from the preceding discussion: there is a definition of the referent  $X$  of a name  $N$  that corresponds to an account  $A$  of  $X$  if and only if  $X$  is one in one of the ways in which a substance is one (explicit at *Z.* 12 1037<sup>b</sup>24–26). But what those ways are is something still to be worked out (*H.* 6 1045<sup>a</sup>14–15). A different though related point is that a sequence of words, such as the sentences constituting the *Iliad*, cannot themselves acquire the unity requisite in a definition simply by being conjoined by “and” (1030<sup>a</sup>8–9): “An account is one in two ways—

either by being tied together, like the *Iliad*, or by making one thing clear of one thing not coincidentally” (*APo.* II 10 93<sup>35–37</sup>; also H 6 1045<sup>12–14</sup>).

Note 719

**An account composed from an addition:** Explained at 1031<sup>4–5</sup>.

Note 720

**There is nose and concavity, and snubness is what is said of things composed of both, as a *this* in *this* (*tode en tô[i]de*):** This form in this matter, both taken universally. See Z 11 1037<sup>7</sup>, also 10 1035<sup>b27–30</sup>, E 1 1025<sup>b28–1026<sup>a6</sup></sup>.

Note 721

**It is not coincidentally that the concavity (*hê koiilotês*) or the snubness (*hê simotês*) is an attribute of the nose:** On the question of how to understand *hê koiilotês* and *hê simotês*, see Z 11 1037<sup>a31–32n</sup>.

**Because Callias, who is coincidentally a human, is pale:** In fact, Callias is intrinsically not coincidentally human, but considered simply as something that is or can be pale, his being human is something coincidental. A similar issue arises at A 1 981<sup>a15–24</sup>.

**In the way all things are that are said to belong to something intrinsically:** See Z 4 1029<sup>b13n</sup>, also Iota 9 1058<sup>a29–34</sup>.

Note 722

**Either there is no essence or definition of any of these [coupled] things, or, if there is, it is in another way, just as we said:** At Z 4 1030<sup>a17–b13</sup>.

Note 723

**That is why it is absurd that the essence should belong to things like this:** One (mild) absurdity is that definitions in which the same thing is stated many times over are “wasted work” (Z 12 1038<sup>a20</sup>). A more serious absurdity emerges when we turn from definitions to the essences that are their ontological correlates. For what in an essence—what in reality—could correspond to the unlimited number of repetitions of a term in a definition?

Note 724

**The being for human and for pale human would be the same:** Reading ἀνθρώπῳ εἶναι καὶ λευκῷ ἀνθρώπῳ τὸ αὐτὸ with FP for OCT καὶ τὸ ἀνθρώπῳ εἶναι καὶ τὸ λευκῷ ἀνθρώπῳ τὸ αὐτό.

Note 725

**A human and a pale human are the same, as they say:** See Δ 9 1017<sup>b31–33</sup>.

Note 726

**The extreme terms do not become the same in the same way:** The argument seems to be this. (1) (the target for refutation) A pale human = the being for a pale human. (2) A human [who is coincidentally pale] = a human. (Generally accepted.) (3) A human = the being for a human. (Implicit. Taken to follow from (1)). (4) The being for a human = the being for a pale human. (From (2) and (3).)

(4) is false, since someone can be a human without being pale, and so (1) must be false. The extreme terms are those in (4), the being for a human and the being for a pale human.

#### Note 727

**But perhaps *this* might seem to follow, namely, that the extreme terms would be the same coincidentally:** Reading τὰ ἄκρα γίνεσθαι ταῦτα κατὰ συμβεβηκός with FP for OCT τὰ ἄκρα γίνεσθαι ταῦτα τὰ κατὰ συμβεβηκός (“that the extreme terms, the ones that are coincidentally, would be the same”). Here the argument parallels the previous one, but employs two coincidental beings, pale human and musical human. (1) A pale human = the being for a pale human. (2) A musical human = the being for a musical human. (3) A human [who is coincidentally pale] = a human. (4) A human [who is coincidentally musical] = a human. (5) A human [who is coincidentally pale] = a human [who is coincidentally musical]. (6) A pale = a musical. (7) The being for the pale = the being for the musical. (7) is false, since the human may remain pale while ceasing to be musical or vice versa.

#### Note 728

**In the case of things said to be [what they are] intrinsically:** See Z 4 1029<sup>b</sup>13n. **Is it necessary that the thing be the same [as its being or essence]?:** Since attributes are said of substances that may be particular matter-form compounds, and in such compounds form is said of matter (Z 3 1029<sup>a</sup>23–24n), only forms or primary substances are truly intrinsic beings (11 1037<sup>b</sup>3–4). A form, however, just is an essence (7 1032<sup>b</sup>1–2), so that things said to be intrinsically must indeed be identical to their essences.

#### Note 729

**For example, if there are some substances to which no substances or any other natures are prior, of the sort that some people say the Ideas are?:** See A 6 987<sup>b</sup>20–21n.

#### Note 730

**If the good-itself and the being for a good are distinct:** The being for an X = its essence (Z 4 1029<sup>b</sup>13–1030<sup>b</sup>13). What is being supposed, therefore, is that the X-itself (the Form of X) ≠ the essence of an X—which is just what the theory supposed it to be (A 6 988<sup>a</sup>10–11, 9 991<sup>b</sup>2).

**There will be other substances and natures and Ideas beyond those that were mentioned:** Since the X-itself ≠ the essence of an X, there must be some Y that is the essence of an X, and so of the X-itself, since the X-itself is a particular X (Z 15 1040<sup>a</sup>8–9). **These other substances will be prior, if the essence is substance:** Y, as the essence and substance of the X-itself, will be prior to the X-itself, just as X-itself is prior to the perceptible particulars that participate in it (for the relevant senses of priority or primacy, see Z 1 1028<sup>a</sup>31–33).

**If the two are detached from each other, then there will be no scientific knowledge of the former ones and the latter ones will not be:** If the X-itself is detached from its essence Y, then (1) Y does not belong to the X-itself (1031<sup>b</sup>4–6). But to have scientific knowledge of each thing is to know its essence (1031<sup>b</sup>6–7), so to

have scientific knowledge of the X-itself is to know Y, which involves knowing that X is (by definition) Y. But (1) Y does not belong to the X-itself, so the X-itself is not Y. So there is no scientific knowledge of the X-itself.

**The latter ones will not be:** If the X-itself is detached from its essence Y, then (2) X does not belong to Y (= Y is not an X) (1031<sup>b</sup>4–6). When X is being, then, being does not belong to Y, so that Y will not be.

Note 731

**By “detached from each other” I mean if [1] the being for a good neither belongs to the good-itself nor [2] being good to the being for a good:** If [1] holds, then the good-itself is not intrinsically or essentially good. If [2] holds, then the essence of good is not good.

Note 732

**On the basis of these arguments, then, each thing itself and its essence are one and the same:** That is, each thing that is said to be intrinsically (1031<sup>a</sup>28–29).

**Even by *ekthesis* the two must be one and the same:** A reference to the Platonic process described in A 9 992<sup>b</sup>10n.

Note 733

**What is to prevent, even as things stand, some things from being their essences straightaway (*euthus*):** See H 6 1045<sup>a</sup>36–<sup>b</sup>2.

Note 734

**There will be an essence for the one:** Reading ἔσται τί ἦν εἶναι, τὸ ἐνὶ εἶναι with FP for OCT ἔσται τί ἦν εἶναι τοῦ ἐνός (“there will be an essence of the one”).

Note 735

**It is evident that *sophistical refutations of this thesis are to be resolved using the same resolution as in whether Socrates and the being of Socrates are the same*:** We do not know what these *sophistical refutations* were, but Aristotle’s response to them is clear from Z 11 1037<sup>a</sup>5–10 and H 3 1043<sup>b</sup>2–4. ‘The soul is the primary substance (1037<sup>a</sup>5), which is an essence or form (7 1032<sup>b</sup>1–2), so if Socrates is his soul, he is identical to his essence or being. But if he is the compound of form and matter, soul and body, he is not identical to it.

Note 736

**Z 7: (1a)** In Z 3 form emerges as the one serious contender for being substance (1029<sup>a</sup>26–33). The issue to be investigated thereafter is not *that* form is primary substance, but *what* form is, since it is “most puzzling” (1029<sup>a</sup>33). **(1b)** On general methodological considerations, it is proposed to begin that investigation by looking at perceptible substances (perceptible matter-form compounds), since these are more familiar to us (1029<sup>a</sup>33–<sup>b</sup>12). **(1c)** It is with Z 7, whose focus is on perceptible matter-form compounds, that the inquiry proposed in Z 3 begins in the advertised terms (Z 10 1035<sup>a</sup>5n, 8–9n). **(1d)** But that investigation is explicitly postponed in order first to say some things about essence in a logico-linguistic way—an investigation which occupies Z 4, with Z 5 and Z 6 as important addenda

(1029<sup>b</sup>13n). (1e) We might expect, then, that Z 7–9 will survey Aristotle's own views of perceptible matter-form compounds with an eye to tightening our grip on form by systematically discussing the different ways in which matter becomes formed. Topics, such as the chance (or spontaneous) generation of certain animals (Z 7 1032<sup>a</sup>29n), that may seem alien to Z, then become readily intelligible. For chance is, with craft and nature, one of these ways. (1f) Z 7–9 need not themselves, then, include lots of new results pertinent to the acknowledged target, which is to get a theoretical grasp not on the form of matter-form compounds, but on the form that is wholly knowable (Z 3 1029<sup>b</sup>10–12). This might help explain why in the summaries given at Z 11 1037<sup>a</sup>21–<sup>b</sup>7 and H 1 1042<sup>a</sup>4–22 the contributions of Z 7–9 are not mentioned. But be that as it may, the palpable difference in difficulty that many readers experience with Z 7–9 in comparison to the other parts of Z should come as no surprise: they are supposed to be less difficult, more knowable to us.

(2a) As (1f) concedes, Z 7–9 are not mentioned in these later summaries. (2b) Moreover, though in most mss. Z 7 begins *tôn de gignomenôn*, where *de* is a connective particle signaling continuity of discussion, in one (A<sup>b</sup>) followed by OCT and FP, *de* is missing, suggesting that Z 7 is, or may once have been, independent from what precedes it. (2c) Z 5 seems to lead seamlessly into Z 10 (with Z 6 treated as a somewhat independent essay). It may be, then, that Z 7–9 was written separately and inserted by Aristotle into an already existing earlier version of Z. If there were—in addition to (2a–c)—also doctrinal failures of fit between Z 7–9 and other parts of Z (or of Z–H–Θ) this would help explain them away. Such apparent failures include 7 1032<sup>b</sup>3–4 (form = primary substance, with health as an example), 1033<sup>a</sup>1–5 (matter as part of the account of brazen circle), 9 1034<sup>b</sup>7–19 (primary things include items in non-substantial categories). These are discussed in the associated notes.

Weakening or qualifying the case for insertion are the various references in later chapters to materials in Z 7–9. The most explicit of these are Z 15 1039<sup>b</sup>26–27, which may itself be an insertion (again a topic dealt with in a note), and Θ 8 1049<sup>b</sup>27, which cannot be. Z 10 1035<sup>a</sup>5, 8–9 might also be cited in this regard. Also weakening it is the fact that while Z 10, like Z 5, discusses definition, it does so precisely in the context of the definition of the matter-form compounds discussed in 7–9.

#### Note 737

**Of things that come to be, however:** Reading τῶν δὲ γιγνομένων with Ross for OCT τῶν γιγνομένων (“Of things that come to be”).

**They all come to be . . . of or from (ek) something:** The ways in which X is said to be *ek* (“of,” “from,” “out of”) Y—catalogued in Δ 24—that are relevant particularly in this chapter and the next are difficult to capture by one English word—hence “of or from” on some occasions. We do not say that a statue is *from* wood but that it is *of* wood, or that it is *wooden*. We do not say either that an embryo is *of* seed, but that it is *from* or develops *out of* seed. Aristotle uses *ek* to cover both sorts of cases, and also, as is inevitable, for other unrelated purposes (for example, Z 8 1033<sup>b</sup>14, 16). For clarity I have added *ek* in parenthesis where relevant, since other prepositions too—*apo*, for example—must sometimes also be translated as “from.”

Note 738

**Some of them, though, may come about from chance** (*apo tautomatou*) **or from luck** (*apo tuchês*): Unlike luck (*tuchê*), which is restricted to the subclass of what results from coincidental efficient causes that are “achievable by action” (*Ph.* II 6 197<sup>a</sup>36–<sup>b</sup>3) and deliberate choice (*K* 8 1065<sup>a</sup>30–32), chance (*to automaton*) applies quite generally to the entire class, and so consists of all those things “whose cause is indefinite and that come about not for the sake of something, and neither always nor for the most part nor in an orderly way” (*Rh.* I 10 1369<sup>a</sup>32–34). Things that come to be by chance are sometimes said to come about spontaneously, or to be spontaneously generated.

Note 739

**Some of the same things sometimes come to be either from** (*ek*) **seed or without seed**: “There are some fish that come to be from mud and sand, even of those genera that also come about from pairing and the egg” (*HA* VI 15 569<sup>a</sup>11–13). Insects (*V* I 539<sup>a</sup>21–26), testaceans (*V* 15 547<sup>b</sup>18–32), and eels (*VI* 16) seem to come about exclusively by chance.

Note 740

**We must investigate these later**: See *Z* 9 1034<sup>a</sup>9–21, <sup>b</sup>4–7.

Note 741

**By form I mean the essence of each thing and the primary substance** (*tên prôtên ousian*): (1a) As we see from the example, the substance at issue here is not a substance but the substance (= essence) of something (*T* 3 1005<sup>a</sup>35n). (1b) Moreover, the form that is identified with that substance need not be the form that *Z* 3 identifies as the only serious contender for being substance, in the sense of the “primary thing” to which attributes etc. belong (1029<sup>a</sup>15–16), since (to repeat) the formal component of a matter-form compound is being investigated not for its own sake but because it is more familiar—better known to us—than the form we are interested in. (1c) What makes health a *primary* substance of something here is that it is not definable as the absence of some other form or essence in the way that disease is definable in terms of it (1032<sup>b</sup>4–5). Primacy here is intra-essence primacy, not the primacy characteristic of substance alone (*Z* 1 1028<sup>a</sup>31–34n).

(2a) As readers of the *Metaphysics* we first encounter the term *prôtê ousia* at *T* 3 1005<sup>a</sup>35, where it refers to the central topic of the science of being qua being. If we have in mind the use of that term in the *Categories*, we will expect the primary substances to turn out to be perceptible particulars, like Socrates or Bucephalus (*Cat.* 5 2<sup>a</sup>11–14). When we next encounter the term, which we do here, we are likely to be initially surprised on two fronts (2a–i) that the phrase does not refer to such a particular and (2a–ii) that health, which is a quality not a substance in *Categories* (and at *Z* 1 1028<sup>a</sup>20–31 for that matter) should be given as an example. Our surprise at (2a–i) should dissipate, however, when we reflect on the double use of *ousia* to refer to substantial particulars and to the substances or essences of them. (2b) When we next encounter *prôtê ousia*, at *Z* 11 1037<sup>a</sup>5, it refers to the soul in contrast to the body, which, as its next occurrence at 1037<sup>a</sup>28–30 makes clear, is



the form present in a thing, from which along with the matter it is composed. (2c) The final occurrences of *prôtê ousia*—and the last in Z—are at 11 1037<sup>b</sup>1–3. But by that point in the investigation of form a conclusion is within reach, namely, that some particulars—though not matter-form compounds, and so not Socrates (if he is such a compound) and not Bucephalus—are identical to their forms or essences, and that it is these, and these only, that are primary substances, now in the sense (2a) of primary subjects of predication that are not predicated of anything else.

(3) So the surprise we do and should feel at (2a–ii), when health is presented as primary substance but primary substance of something should now dissipate as well. Health is a substance in the sense of essence of something, and it is primary in the sense, specified in (1c), relevant to essences. But since health exists by being one thing in another—namely, a certain condition in a body (T 2 1003<sup>a</sup>34–<sup>b</sup>1)—it is not identical to its essence, and so is not a primary substance.

#### Note 742

**Since it is by its absence that disease is made clear:** Reading ἐκείνης γὰρ ἀπουσίᾳ δηλοῦται ἡ νόσος with FP for OCT ἐκείνης γὰρ ἀπουσία ἡ νόσος (“since disease is the absence of health”).

#### Note 743

**He goes on, always understanding things in this way, until he is led to a final this that he himself is able to produce:** “A deliberator seems to inquire and analyze in the way we said just as though he were dealing with a diagram—but whereas it is evident that not all inquiry is deliberation (for example, mathematical inquiry), all deliberation is inquiry. And the last thing found in the analysis seems to come first in bringing about the result” (NE III 3 1112<sup>b</sup>20–24).

#### Note 744

**The movement from this point onward is called a production:** “Just as the hypotheses are starting-points in the theoretical sciences, so too in the practical ones the end is starting-point and hypothesis. Since this person needs to be healthy, it is necessary for this to be present, if that is to be the case, just as in the former, if a triangle is equivalent to two right angles, then it is necessary for this to be the case. The starting-point of understanding, then, is the end, but the starting-point of action is where understanding terminates” (EE II 11 1227<sup>b</sup>28–33).

#### Note 745

**This last thing that produces health is in this way a part of health:** Reading τοῦτο δ' ἔσχατόν καὶ τὸ ποιοῦν οὗτος τὸ μέρος ἐστὶ τῆς ὑγείας, for OCT τοῦτο δ' ἔσχατόν ἐστι, τὸ ποιοῦν τὸ μέρος τῆς ὑγείας (“And this, namely, what produces the part of health, is the last thing”). The view thus parallels those in the following texts: “[Practical wisdom and theoretical wisdom] must be intrinsically choice-worthy (since each is the virtue of one of the two parts that have reason) even if neither of them produces anything at all. Next, they do indeed produce something; not, however, as medicine produces health but as health does. That is also how theoretical wisdom produces happiness, since as a part of virtue as a whole, by being possessed and actualized, it produces happiness” (NE VI 12 1144<sup>a</sup>1–5);

“Things are produced in three ways: as health produces health, as food produces health, and as physical training does” (*Rh.* I 6 1362<sup>a</sup>31–33).

Note 746

As is said, coming to be is impossible if there is nothing preexisting: See *GC* I 3 317<sup>b</sup>29–31 (quoted in *A* 3 983<sup>b</sup>18n).

Note 747

The brazen circle, then, does have the matter in its account: “The brazen circle” can be (1) a generic noun phrase or (2) a singular term (*Z* 10 1035<sup>b</sup>27–31). Since the account is of the universal (10 1035<sup>b</sup>34–1036<sup>a</sup>1), (1) must be the sense here. Consequently the brazen circle, which is the referent of the generic noun phrase, must be a universal compound not a particular. When we see how that compound is constructed (10 1035<sup>b</sup>27–30), we will also see how and why the present claim is consistent with the claim that “only the parts of the form are parts of the account” (1035<sup>b</sup>33–34). See headnote to the present chapter.

Note 748

Are said not to be *that* (*ekeino*) but *thaten* (*ekeinon*): *Ekeinon* is an Aristotelian coinage to which the “en” suffix generates only rough analogues in English.

Note 749

The human being who is healthy, by contrast, is not said to be of that from which (*ek*) he comes: Reading  $\delta\delta\epsilon\ \alpha\nu\theta\rho\omega\pi\omicron\varsigma\ \delta\ \upsilon\gamma\iota\alpha\iota\nu\omega\nu\ \omicron\upsilon\ \lambda\acute{\epsilon}\gamma\epsilon\tau\alpha\iota\ \acute{\epsilon}\kappa\epsilon\iota\nu\omicron\nu\ \acute{\epsilon}\xi\ \omicron\upsilon$  with FP for OCT  $\delta\delta\epsilon\ \alpha\nu\theta\rho\omega\pi\omicron\varsigma\ \delta\ \upsilon\gamma\iota\alpha\iota\nu\omega\nu\ \omicron\upsilon\ \lambda\acute{\epsilon}\gamma\epsilon\tau\alpha\iota\ \acute{\epsilon}\kappa\epsilon\iota\nu\omicron\nu\ \acute{\epsilon}\xi\ \omicron\upsilon$  (“The human who is healthy, by contrast, is not said to be that of or from which”). A healthy X is an X *of health*, as a wealthy man is a man *of wealth*. That of or from which X comes to be healthy (of health) is an X *of sickness* (a sick X). But more specifically it is *of or from sickness* (the lack of health) that his being *of health* comes.

Note 750

We have already determined the way in which we say this: At *Z* 7 1032<sup>a</sup>17.

Just as the producer does not make the underlying subject (the bronze), so he does not make the sphere either: Another place where it is important to keep in mind the distinction between “the sphere” as (1) a generic noun phrase and as (2) a singular term (*Z* 10 1035<sup>b</sup>1–3). The producer does not produce the referent of (1), any more than the tiger in the jungle gives birth to the tiger by giving birth to the tiger in the Bronx Zoo, but does produce the relevant referent of (2).

Except coincidentally (*kata sumbebēkos*): For a parallel, see *A* 1 981<sup>a</sup>18–20.

Note 751

[1] What is wholly (*holōs*) the underlying subject: Or [2] “the underlying subject as a whole or in the full sense.” In [2] the underlying subject is the one that is already in the form requisite for production—bronze, for example, not its elements (*Z* 3 1029<sup>a</sup>2–4). In [1] it is what, as yet, has not got the form that the producer will put into it. In the context, [1] is perhaps more likely than [2].

## Note 752

**For we assumed this** (*touto gar hupekeito*): That all things that come to be do so from something was assumed at 1033<sup>a</sup>25. The verb *hupokeisthai* also means “to underlie,” however, as in *to hupokeimenon* (“the underlying subject”), so this clause could also refer to the need a maker of anything would have for an underlying subject.

## Note 753

**It is evident, therefore, that neither does the form . . . come to be:** Reading *φανερὸν ἄρα ὅτι οὐδὲ τὸ εἶδος . . . οὐ γίγνεται* with Ross and FP for OCT *φανερὸν ἄρα ὅτι τὸ εἶδος . . . οὐ γίγνεται* (“It is evident, therefore, that the form . . . does not come to be”). That the matter is not made has just been shown, the task now is to show that the form is not made either.

## Note 754

**In this specific thing he produces this specific form:** Reading *εἰς τοδὶ γὰρ τοδὶ τὸ εἶδος ποιεῖ* with FP for OCT *εἰς τοδὶ γὰρ τὸ εἶδος ποιεῖ* (“in this specific thing he produces this form”).

## Note 755

**What is said to be the substance as form does not come to be:** Reading *τὸ μὲν ὡς εἶδος οὐσία λεγόμενον οὐ γίγνεται* with FP for OCT *τὸ μὲν ὡς εἶδος ἢ οὐσία λεγόμενον οὐ γίγνεται* (“what is said as form or substance does not come to be”).

## Note 756

**Or any house beyond the one of bricks:** Reading *ἢ οἰκία παρὰ τὰς πλινθίνους* with FP for OCT *ἢ οἰκία παρὰ τὰς πλινθους* (“or any house beyond the bricks”).

## Note 757

**The animal and the human** (*ho anthrōpos kai to zō[i]on*) **are like brazen sphere in general** (*sphaira chalkē holōs*): *Sphaira chalkē holōs* refers to the sort that all particular brazen spheres belong to. Similarly *ho anthrōpos* and *to zō[i]on* are generic noun phrases referring not to a particular human or a particular animal but to the sorts of things to which all humans, on the one hand, and all animals, on the other, belong.

## Note 758

**Human begets human—unless what is begotten is contrary to nature, as when a horse begets a mule:** See Z 9 1034<sup>a</sup>34–<sup>b</sup>4.

## Note 759

**Socrates and Callias are distinct because of their matter (for that is distinct):** The particular flesh and bones of which Socrates is composed at time  $t_1 \neq$  the particular flesh and bones of which Callias is composed at  $t_1$ . See Δ 6 1016<sup>b</sup>31–35, Iota 3 1054<sup>a</sup>32–35, Λ 8 1074<sup>a</sup>31–35.

**But the same in form (for the form is indivisible):** Aristotle will soon refer to his account of the transmission of form from a male progenitor to an offspring (Z 9 1034<sup>a</sup>33–<sup>b</sup>4). This account seems to presuppose, though, that forms are sufficiently

rich and differentiated to account for heritable attributes that go well beyond those that constitute the species' form that is the same in Socrates, Callias, and all other human beings. The way in which form is disabled or "deformed" in the transmission process by the relevant matter—the female menses in the human case—may help dissipate the apparent tension. What gets deformed as a result of the accidents of transmission is the species' form, which is the same in each. But what results from those deformations, namely, the particular form, is different, and different in ways that an adequate embryological theory must explain.

#### Note 760

**By chance** (*apo tautomatou*): See Z 7 1032<sup>a</sup>29n.

#### Note 761

**The matter that serves as the starting [-point] of the process of coming to be in some cases of making something or of something's coming to be by craft, and that has some part of the product present in it:** A builder might begin making a house from this pile of wood, which is what is serving as the (material) starting-point of his building. But in the process of building he may discard some of the pile, while the rest of it ends up as part of the final product—the house.

**The matter . . . in some cases of making something or of something's coming to be by craft . . . is of [1] a sort that can be moved by itself:** A reference to the sort of case described at Z 8 1032<sup>b</sup>25–26, where a body's own heat, which a doctor would produce in it by rubbing, causes health without the doctor's intervention.

**Whereas in others [2] it is not:** The things under discussion in Z 9 are (i) things that come to be by craft and by chance and (ii) things that come to be not by both craft and chance (that is, neither by craft nor by chance). The self-moving matter described in [1] is either [1a] self-moving matter that can produce things in (i) or [1b] self-moving matter that cannot produce things in (i). The non-self-moving matter described in (2), then, is matter that is neither in [1a] nor in [1b]—that is, matter that does not move itself either to produce (i) things that come about by craft and by chance or (ii) things that come about neither by craft nor by chance. Since things come to be either by craft or by chance or by nature (Z 7 1032<sup>a</sup>12–13), the matter in (2) must be that of beings that come about by nature alone.

#### Note 762

**The things, then, whose matter is of [1b] the latter sort—for example, the stones—cannot be moved in the particular way required [for example, to compose a house] except by something else, although they can in another way, as can fire:** Reading *kai tò πῦρ* ("as can fire"), which OCT and FP bracket for deletion. The other way referred to is the capacity the sublunary elements—earth (stone), water, fire, and air—have to move to their so-called *proper places*, unless prevented (*Ph.* VIII 4 255<sup>b</sup>13–17). Thus earth naturally moves toward the place at the center of the universe. Similarly, fire naturally moves up, to surround air, as air does to surround water, which in turn would move to surround earth.

## Note 763

**There is a way in which all things come to be [1] from something with the same name . . . or [2] from a part with the same name . . . or [3] from what has some part [of what comes to be]:** Reading ἐξ ὁμωνύμου . . . ἢ ἐκ μέρους ὁμωνύμου . . . ἢ ἐξ ἔχοντός τι μέρος with FP for OCT ἐξ ὁμωνύμου . . . ἢ ἐκ μέρους ὁμωνύμου ἢ ἔχοντός τι μέρος (“from something with the same name . . . or from a part with the same name or what has some part [of what comes to be]”). [1] As when a human comes to be from another human. [2] As when a product comes to be from craft, since part of it is its formal component, which has the same name as the form in the understanding of the craftsman who made it. [3] As when something comes to be from matter, of some part of which it is composed.

## Note 764

**It is from the what-it-is that the deductions come, and from there too the comings to be:** The reference need not be to all deductions, since these need not all have the what-it-is as starting-points, but to the sorts of deductions employed by a doctor or other producer on which comings to be are modeled, which do have such starting-points (Z 8 1032<sup>a</sup>32–<sup>b</sup>30).

## Note 765

**The seed is a producer in the same way as the things that are from craft, since it has the form potentially:** “So far as things formed by nature or by human craft are concerned, the formation of what is potentially is brought about by what is actually” (GA II 1 734<sup>a</sup>29–31); “The male provides both the form and the source of movement while the female provides the body, that is, the matter” (I 20 729<sup>a</sup>9–11); “Nothing comes away from the carpenter to the matter of the timbers, nor is there any part of the craft of carpentry in the product, but the shape and the form are produced from the carpenter through the movement in the matter. And his soul, in which the form is and his scientific knowledge, moves his hands or some other part in a movement of a particular sort, different when the product is different, the same when it is the same, and the hands move the instruments, and the instruments move the matter. Similarly, the male’s nature, in those that emit seed, uses the seed as an instrument containing actual movements, just as in craft productions the instruments are in movement; for the movement of the craft is in a way in them” (I 22 730<sup>b</sup>11–23); “Seed is a residue from that nourishment which is a form of blood—that which is finally distributed to the parts [of the body]. This is why it has great capacity . . . and why it is reasonable that offspring should resemble their parents. For that which goes to all the parts [namely, the blood] resembles that which is left over [the seed]. Hence the seed of the hand or of the face or of the whole animal is in an undifferentiated way a hand, or a face, or a whole animal, that is, what each of the latter is actually, such seed is potentially” (I 9 726<sup>b</sup>10–18).

## Note 766

**Except where there is a disability:** Reading ἐάν μὴ πῆρωμα ἦ here with FP rather than after “from man” at 1034<sup>b</sup>3 with OCT.

**Disability** (*pêroma*): *Pêroma* is often translated as “deformation” or as “mutilation.” But, unlike either a deformation or a mutilation, a *pêroma* must have an effect on functioning and may be a part of a thing’s essential nature. Being female, for example, is “like a natural disability (*anapêrian phusikên*)” (IV 6 775<sup>a</sup>15–16), affecting the ability to reproduce: “The female exists in virtue of a particular incapacity, in being unable to concoct seed out of the nutriment in its last stage (which is either blood or the analogous part in the bloodless animals) owing to the coldness of her nature” (GA I 20 728<sup>a</sup>18–21). On the other hand, someone may be *pêros* (blind, for example) not by nature but simply as a result of an accident or a condition such as drunkenness (NE III 5 1114<sup>a</sup>25–28).

#### Note 767

**We should not look for all offspring to come to be in the same way as human does from human, since even woman comes from man** (*ex andros*): “The [male] seed is a residue and moves with the same movement as that in accord with which the body grows through the distribution of the ultimate nourishment [namely, blood]. When it comes into the uterus it causes the female’s residue [that is, the menses] to take shape and moves it in the same movement in which it is itself actually moving. For the menses is also a residue, and contains all the parts [of the body] potentially, though none actually. It even has in it potentially those parts that differentiate female from male. And just as offspring from parents with a disability are sometimes born with a disability and sometimes not, so offspring from a female are sometimes female and sometimes not female but male. For the female is like a male with a disability, and the menses is seed, only not pure. For it does not have one thing in it, namely, the starting-point of the soul” (GA II 3 737<sup>a</sup>18–30); “It is necessary to take hold of the universal hypotheses . . . that some movements [those in the female menses] are present potentially and others [those in the male seed] actually . . . that what gets mastered changes over into the opposite; that what slackens passes into the movement that is next to it: slackening a little into a movement that is close by; more, into one that is farther away; finally, the movements so run together that it [the fetus or offspring] does not resemble any of its own or kindred, rather all that is left is what is common, and it is [simply] human” (IV 3 768<sup>b</sup>5–12).

#### Note 768

**Where all the primary things (*tôn prôtôn*) are concerned the account is equally applicable—for example, to quantity, quality, and the other categories:** *Ta prôta* here are not the primary substances (Z 4 1030<sup>a</sup>10–11n), but the first or highest genera into which beings fall, namely, the categories (B 3 998<sup>b</sup>15n). See headnote to Z 9.

#### Note 769

**And [the sphere] comes to be in the bronze:** Reading καὶ ἐπὶ χαλκοῦ γίγνεται for OCT καὶ ἐπὶ χαλκοῦ, εἰ γίγνεται (“the same holds too in the case of bronze, if it comes to be”).

## Note 770

**It is necessary for there always to preexist another substance:** Reading ἀναγκαῖον προϋπάρχειν αἰεὶ ἑτέραν οὐσίαν ἐντελεχεία for OCT ἀναγκαῖον προϋπάρχειν ἑτέραν οὐσίαν ἐντελεχεία (“it is necessary for there to preexist another substance”).

## Note 771

Z 10: See Z.7 headnote.

## Note 772

**A definition is an account:** Unconditionally, and in the primary way, a definition is an account of an essence or substance ( $\Delta$  8 1017<sup>b</sup>21–23, Z 4 1030<sup>a</sup>6–11, 1030<sup>b</sup>4–6). But, since something can be said to be a definition in many ways, there is a derivative way in which things other than substances—attributes and so on—also have definitions (Z 4 1030<sup>a</sup>17–27, 5 1031<sup>a</sup>11–14).

**Every account (*logos*) has parts:** An account consists of names (Z 15 1040<sup>a</sup>9–10), but whereas a name like “the circle” signifies a sort of whole “in an indivisible way,” the account “divides it into its particular [components]” (*Ph.* I 1 184<sup>b</sup>1–3).

**As the account is to the thing, so the part of the account is to the part of the thing:** This claim seems to extend to definitional accounts in general, and not just to definitions of substances, since the examples given (syllables, circles, angles, fingers) are not restricted to these. But understood in one way it is particularly problematic in their case. A definitional account *defines* the thing, but it is not—indeed cannot in general be—the case that a part of the account defines a part of thing, since such a process of definition would go without limit, which is impossible ( $\alpha$  2 994<sup>b</sup>26–27). When a name *N* signifies the same as an account *A*, however, then *A* is an account of the object *O* that is the referent of *N* (Z 4 1030<sup>a</sup>7–9). So the thought here must rather be this: As *A* signifies *O*, so the parts of *A* signify the parts of *O*.

**A puzzle already arises as to whether the account of the parts is present in the account of the whole, or not:** Suppose that the name *N<sub>p</sub>*, which is part of *A*, names *O<sub>p</sub>*, which is part of *O*, and that the account *A<sub>p</sub>* signifies the same as *N<sub>p</sub>*. Since the parts of *A* signify the parts of *O*, and *N<sub>p</sub>* is part of *A*, and *N<sub>p</sub>* and *A<sub>p</sub>* both signify *O<sub>p</sub>*, and *O<sub>p</sub>* is part of *O*, it seems that *A<sub>p</sub>* must be part of *A*. But—and this is what gives rise to the puzzle—“in some cases they evidently are present, but in some not” (1034<sup>b</sup>24).

## Note 773

**But the wholes [1] seem (*dokei*) to be prior. For [2] in the account the parts are described in terms of (*ek*) the wholes, which are [3] also prior with respect to being without each other:** [2] is clear enough (1035<sup>b</sup>4–11). [3] is clear in the case of a finger, which cannot exist as a functioning finger when separated from the body (1035<sup>b</sup>22–25), whereas the body can exist without it. But it is less clear in the case of the acute angle, since if we remove an acute angle from a right angle it ceases to be a right angle, while the acute angle continues to exist. Similarly, the line ceases to exist when divided, whereas the half-lines into which it is divided, continue to do so. This may be what explains the *dokei* in [1]. For we might think

that because a finger was like an acute angle in [2], it was also like it in [3]. And we might be led to this in part because we are not keeping clearly in mind that “the right angle” and “the acute angle” can refer either to (a) a matter-form compound, such as this brazen right angle, or to (b) the formal element in such a compound (1035<sup>a</sup>1–10, H 3 1043<sup>a</sup>29–<sup>b</sup>4). For thinking in terms of (a) will lead us to think that the right angle has the acute angle as a part, while thinking in terms of (b) will lead us to think that the part depends for its existence on the whole.

#### Note 774

**A part in one way is what measures with respect to quantity:** We measure X by determining how many parts of a standard size (1 inch, 1 ounce) it contains (Δ 25 1023<sup>b</sup>12–17, Iota 1 1052<sup>b</sup>20–1053<sup>a</sup>30).

#### Note 775

**Of the snubness flesh is a certain part:** Reading μέρος τι (“certain part”) for OCT μέρος (“part”), See E 1 1025<sup>b</sup>30–1026<sup>a</sup>6, Z 5 1030<sup>b</sup>14–1030<sup>a</sup>11.

**For this is the matter in which it comes to be** (*epi’ hês gignetai*): Coming to be is not mentioned in Z until 7 1032<sup>a</sup>12, which begins a lengthy discussion of it that justifies the present claim.

#### Note 776

**Of the compound statue the bronze is a part, but of what is said to be a statue as form it is not a part:** See H 3 1043<sup>a</sup>29–<sup>b</sup>4.

#### Note 777

**Each thing (*hekaston*) may be said (*lekteen*) to be the form, or the thing insofar as it has the form** (*to eidos kai hê[i] eidos echei*), **but may never be said** (*oudepo-te . . . lekteen*) **to be intrinsically the material component** (*to hulikon*): I take (1) *lekteen* to be giving and—when negated—withholding permission. But it could equally be taken as (2) mandating or requiring, and be translated as “must” or “should.” I take *hekaston* as (3) subject and (a) *to eidos kai hê[i] eidos echei* and (b) *to hulikon* as predicate. But as far as grammar goes it is also possible (4) to take *hekaston* as predicate and (a) *to eidos kai hê[i] eidos echei* and (b) *to hulikon* as subjects. A reason to prefer (1) over (2) and (3a) over (4a) is that Aristotle is explicit that the house *may* signify (or may be) either a matter-form compound or its formal element, warning us that we should be careful not to overlook that fact (H 3 1043<sup>a</sup>29–31). So to tell us that we *should* or *must* say that a thing is a form or a compound would be strange. *Hekaston* must be treated in the same way in (a) and (b). But in (b) it must, as in (3b), be predicate, not subject, as in (4b). For in a matter-form compound C, the form F is predicated of the matter m (Z 3 1029<sup>a</sup>23–24). But if F is, or may, or should, be said to be C, then C is (in one of its legitimate uses or senses) also predicable of m, contrary to (4b).

**Each thing [X] may be said to be the form [Y], or the thing insofar as it has the form [Z]:** If X is a matter-form compound, it may be said to be Z in a straightforward way, since X = Z, but it is not Y in that way (Z 11 1037<sup>a</sup>7–8). If X is a form or primary substance it is Y in a straightforward way, since X = Y, but if it is Z it is in a way parallel to that in which a matter-form compound is Y. The way in which the



bronze statue (say) may be said to be the form of the bronze statue is perhaps clearest in cases of change of matter over time: "That bronze statue is over a thousand years old, but, like the ship of Theseus, it has been repaired so many times that I'm not sure whether any of the original bronze remains in it."

**But may never be said to be intrinsically the material component (to *hulikon*):** Another claim made in Z 10 that refers us back to Z 7–9 for support. What a bronze statue is intrinsically is not the bronze (of which it is composed), or indeed bronze, but *of* bronze, or brazen (Z 7 1033<sup>5</sup>–23). *Hulikon* is the neuter singular of an adjective derived from *hulê*, as the English adjective "material" derives from "matter." To *hulikon* is thus "the material something-or-other," namely, the material component of the compound statue, thus *hulikê ousia* (H 4 1044<sup>15</sup>, © 7 1049<sup>36</sup>) is "material substance."

### Note 778

**The phonetic elements are parts of the account of the form, and are not matter:** Because the form of the syllable AB is defined in terms of A and B, they are parts of it. At Z 17 1041<sup>b11</sup>–33, the letters that are said to be "present in the syllable as matter" (1041<sup>b32</sup>), are parts of the form (not of the compound syllable under discussion here), which by then has emerged as itself having the matter-form structure of a "this in this"—this arrangement (form) in these letters (matter).

**The segments are parts in this way, namely, as matter in which the form comes to be:** The form of the circle (or the circle as form) is defined without reference to the segments. So there is no question of them being parts of it in the way that A and B are parts of the form of the syllable. It is only as having come to be in some matter, whether intelligible or perceptible, that the circle has such things as segments as parts. Of the circle as form, then, the segments are not parts, whereas of the circle as compound of matter and form they are. Focus now on the segments. The form of a segment makes reference to the circle: the segment is such-and-such part of the circle. The segment itself is such-and-such part of the circle in such-and-such matter, whether intelligible or perceptible. The circle comes to be from a collection of such segments when its form comes to be instantiated by them.

**Although they are closer to (*egguterô*) the form than the bronze is to the circle when circularity comes to be in bronze:** "If you take the extremes, matter is not any other thing beyond itself, and the substance is nothing other than the account [= the form], but the intermediates [= matter-form compounds] are related to each in proportion to their closeness (*eggus*) to it" (*Met.* IV 12 390<sup>a4</sup>–7). Thus the segments are closer to the form of the circle, because its definition is part of theirs, so that they already look like parts of a circle. Of the definition of the (form of) the bronze, by contrast, the definition of the circle is not a part, with the result that the unformed bronze has nothing incipiently circular about it. Put another way, the segments, as relatively more formed than the bronze, require less in the way of additional form to compose a circle. That is one reason why the segments might seem to be parts of the form of the circle and not just parts of it as matter.

## Note 779

**Even if the line when divided passes away into the halves, or the human into the bones, sinews, and flesh, it is not the case that because of this they are composed of these as being parts of the substance, but rather as from matter:** The line that can be divided into two halves, and thus get destroyed, is the particular line, which is composed of the form of the line and a particular parcel of intelligible or perceptible matter. Even though it passes away into the two halves, so that they are in that way parts of it, they are not parts of the substance (= the form) of the line. Similarly, for flesh, bones, and sinews.

**But of the form and (*kai*) what the account is of they are not parts at all:** It is natural to treat *kai* as epexegetic or explanatory, equivalent in meaning to, “that is.” What the account is of, then, is the form—for example, the form of the human. And what are not parts of it are the particular flesh, bones, and sinews that a particular human might pass away into.

## Note 780

**That is why they are not in the accounts either:** “They” clearly refers to the parts that have just been under discussion, things like these particular half-lines or these particular bones. Since such things cannot be present in accounts, this is another of the places where Aristotle is not being careful to distinguish accounts from what they are accounts of, names from their *nominata* ( $\Delta$  6 1015<sup>b</sup>25n). More carefully expressed, what he means is this: If A is the account of O and  $O_p$  is not part of O, then  $N_p$ , which is the name of  $O_p$ , is not part of A. Accounts, however, are of universals (1035<sup>b</sup>34–1036<sup>a</sup>1 below), and so just as O cannot be a particular line or a particular human, so  $O_p$  cannot be a particular half-line or a particular bone, and  $N_p$  cannot be the name of such a thing.

## Note 781

**In the account of some things, then, the account of the parts that are such as these (*tôn toioutôn merôn*) will be present, whereas in that of others it must not be:** The parts referred to as “the parts that are such as these” can only be the particular parts—these half-lines, these bones—that have just been under discussion. But since accounts are of universals (previous note), the accounts of them must be of the universals of which the things themselves are instances. We should understand *tôn toioutôn merôn* not as meaning “parts that are like these in being particular,” but as “parts that are like these in belonging to the same sort or kind.” This restores the crucial difference that Aristotle has been arguing for, between accounts of things like the syllable, in which the accounts of the parts are present, and those like the circle, the human, and the line, in which they are not.

## Note 782

**Things, in fact, that are combinations of the form and the matter, for example, the snub or the brazen circle, are the ones that pass away into these parts:** Aristotle focuses on passing away, ignoring coming to be, because he is discussing both natural objects (human beings) and mathematical ones (circles). It is easy to see

what parts the objects of mathematics come to be from, but much less easy to see this in the case of natural ones.

**These parts:** That is, the half-lines, and the bones, sinews, and flesh (1035<sup>a</sup>18–19). **Things, in fact, that are combinations of the form and the matter:** These can be either universal compounds or particular instances of them, since it is true both that the human (the referent of the generic noun phrase) passes away into the parts and that the human (the referent of the singular term) does.

#### Note 783

**Things whose accounts are of the form alone, are the ones that do not pass away, either at all or not in this way:** Z 8 1033<sup>a</sup>32–<sup>b</sup>18 has argued that forms are not begotten or made by anyone—that they do not come to be—but does not make the cognate point about passing away. Z 15 1039<sup>b</sup>20–27 does make it, though, ad-ducing the Z 8 discussion as its basis. More is said on the topic in II 3 1043<sup>b</sup>14–24.

#### Note 784

**Of the combinations these are starting-points and parts:** The brazen semicircles are parts of the brazen sphere (the sphere combined with the bronze), and—since such parts are prior to such wholes—starting-points of it.

#### Note 785

**Something is said to be the circle homonymously, [since the term is applied] both to the one said to be such unconditionally and to the particular one:** Noun phrases consisting of the definite article plus a noun (“The N”) are similarly am-biguous (homonymous) in English, since they can be either singular terms refer-ring to unique particulars (“The dog bit me,” “The man looked at me crossly”) or generic terms (“The bat is a nocturnal creature,” “The human is a predatory animal,” “The potato is indigenous to South America”).

#### Note 786

**The truth has now been stated, but nonetheless let us take up the topic again and state it yet more perspicuously:** Compare NE VI I 1138<sup>b</sup>25–26. The fact that perspicuity involves going back to starting-points (A 4 985<sup>a</sup>13n) is presumably what justifies the subsequent specification of priority relations. These were not mentioned in the previous discussion, making it less perspicuous.

#### Note 787

**The account of the acute divides into the right (*eis oxeias*):** We expect “into the account of the right,” but Aristotle is not always careful to distinguish accounts from what they are accounts of (Δ 6 1015<sup>b</sup>26n). Another example of the same phenomenon occurs at 1035<sup>b</sup>13: “those that are parts [of the thing] as parts of the account and of the substance.”

#### Note 788

**The soul of animals (for this is substance of the animate) is the substance that is in accord with the account and is the form and the essence of such-and-such sort of body:** “The soul is the first actuality (*entelecheia*) of a natural body that has

life potentially. And something will be such insofar as it has instrumental parts (*organikon*). . . . If, then, we are to speak of something common to all soul, it will be the first actualization of a natural body that has instrumental parts" (DA II 2 412<sup>a</sup>27–<sup>b</sup>6).

**The parts of this are prior, either all or some, to the compound animal, and similarly, then, to each particular animal:** The form (soul) of the animal is the actualization of a certain sort of body, and so cannot be defined without reference to it. When this form or soul is transmitted from a male progenitor to a fetal offspring, it first appears in the fetal heart. To the fetal heart the form or soul is not prior, then, but simultaneous (1035<sup>b</sup>25–27). But the soul is complex not simple: it has a nutritive part, a perceptual and desiring part, and (in the case of humans) a bipartite rational part, some of which are separate in account from each other (DA II 2 413<sup>b</sup>11–16, NE VI 1 1139<sup>a</sup>3–11), and some (such as understanding) separate altogether (DA III 5 430<sup>b</sup>17–25, GA II 3 736<sup>b</sup>22–29). Some of these parts (such as the nutritive one) can be actualized in the fetal heart. Others (such as sensation) cannot be actualized till later in the process of embryonic development—which explains why abortion is permitted prior to that time (*Pol.* VII 16 1335<sup>b</sup>24–26). Others (such as the rationally deliberative part) are not actualized until the (human) animal has reached full maturity in adult life (NE III 2 1111<sup>b</sup>8–10). If “the compound animal” is the fully functional mature compound animal, then, some parts of the form or soul are prior to it, while others are not.

**Each part, if it is to be defined correctly, will not be defined without its function, which it could not have without perception:** On functions and their relation to definitions, see B 2 996<sup>b</sup>7n. “Without perception” does not mean that each part of an animal must be capable of perception, but rather that it must have the sort of function that it can only have as part of animal that as such is capable of perception (A 1 980<sup>a</sup>28n).

# Note 789

**Some of these parts, though, are simultaneous, namely, the ones that are controlling and in which the account and the substance are first found—for example, the heart, perhaps, or the brain:** “Nothing generates itself, but when it has come to be from that point on it causes itself to grow. That is why one part comes to be first and not all of them at the same time. And so the one that must first come to be is the one that has a starting-point of growth. (For whether they are plant or animal, this, the nutritive capacity, is present in all of them alike. But this is also the capacity of begetting another like itself. For this belongs to every animal and plant that is complete in its nature.) And it is necessary because of this that once something has come to be it must grow. Though it was generated, then, by something with the same name as itself, as human by human, it grows because of itself. Hence it is something (*ti*) since it makes itself grow. If, accordingly, it is one something (*hen ti*), and this the first [to be such], then this must come to be first. And so if the heart comes to be first in certain animals (or in those that have no heart the part analogous to it), it is from this (or from its analogue) that they would have their starting-point” (GA II 1 735<sup>a</sup>13–26). See also Δ 1 1013<sup>a</sup>5–6n.

## Note 790

**Human and the horse, though, and things that are in this way** (*houtôs*) **set over the particulars, that is, [taken] universally**: The reference of the demonstrative adverb *houtôs* is presumably to 1035<sup>b</sup>1–3, where the point is made in linguistic terms: “the human,” “the horse,” “the circle,” and in general “the N” are homonymous. The relevant way to take them is as generic noun phrases, referring to universals, not as singular terms.

[The human and the horse] are not substance but rather a compound of a sort, [consisting] of this account (*toudi tou logou*) and this matter (*têsdî tês hulês*) **taken universally** (*hôs katholou*): This account = the form that the account is of ( $\Delta$  6 1015<sup>b</sup>24–25n). So the claim in linguistic terms is that the generic noun phrase “the human” has as its referent a certain universal constructed as follows. Begin with a particular human, such as Socrates. Use the demonstrative pronoun *tode* (of which *toudi* and *têsdî* are the neuter and feminine genitive singulars) to pick out first his particular form and particular matter and then use *hôs katholou* to go from these, in a way familiar from the semantics of natural kind terms as rigid designators, to the universals of which these are instances. The result is a universal compound = this (human) sort of form in this (human) sort of matter.

**A compound of a sort** (*sunolon ti*): The universal has the same structure as the corresponding particular (Z 11 1037<sup>a</sup>9–10), but it is not a full-blooded compound in the way they are.

## Note 791

**Socrates is already composed of the ultimate matter** (*ek tês eschatês hulês*): The ultimate—or, as it sometimes called, *proximate*—matter here (as at H 6 1045<sup>b</sup>18) is the matter in which the relevant form is first present (contrast  $\Lambda$  3 1069<sup>b</sup>35–1070<sup>b</sup>4). It is referred to as “ultimate” or “last” because in the process of producing matter suitable for receiving the form it comes last. In the case of a statue, this might be bronze, which is produced from copper and tin. In the case of Socrates, it is the matter (namely, his mother’s menses as first set in form-transmitting motions by his father’s seed to produce his own fetal heart) that constitutes him when he first comes to be a *tode ti*: “The special and the particular always has more strength in coming to be. For Coriscus is both human and animal, but human is closer to what is special than animal. In coming to be, both the particular and the genus are operative, but more so the particular. For this is the substance. For indeed the offspring comes to be something (*ti*) too, but also a this something (*tode ti*), and the latter is the substance. That is why it is from all these capacities that the movements in the seed come” (GA IV 3 767<sup>b</sup>29–36).

## Note 792

**A part, then, can be a part . . . of the compound that is composed of the form and the matter itself**: Reading τοῦ συνόλου τοῦ ἐκ τοῦ εἶδους καὶ τῆς ὕλης αὐτῆς with FP for OCT τοῦ συνόλου τοῦ ἐκ τοῦ εἶδους καὶ τῆς ὕλης καὶ τῆς ὕλης αὐτῆς (“the compound that is composed of the form and the matter, or of the matter itself”). Parts of the matter alone, as opposed to parts of the compound, are not mentioned or presupposed elsewhere.

Note 793

**Only the parts of the form are parts of the account, and the account is of the universal:** For clarity look at a universal compound  $C = \text{this form } F \text{ in this matter } m$ , taken universally. The account of  $C$  will involve an account of  $F$  and an account of  $m$ . But accounts are always of the form. So the account of  $m$  will be of  $F^*$ , which is the form of  $m$ . That is the point Aristotle will make in a few lines by saying that because things are always known by a universal account, matter is intrinsically unknowable (1036<sup>a</sup>7–9).

Note 794

**The being for soul and soul are the same:** See Z 11 1037<sup>a</sup>5–10.

Note 795

**Perceptible:** See A 1 981<sup>a</sup>6n.

**Intelligible:** M 10 1087<sup>a</sup>10–25.

**It is with understanding or perception (*meta noêseôs ê aisthêseôs*) that they are known, and when they depart from this actuality (*ek tês entelecheias*) it is not clear whether they are or are not:** “For we all suppose that what we know scientifically does not at all admit of being otherwise, whereas, in the case of things that do admit of being otherwise, whenever they are [away] from being contemplated (*exô tou theôrein*) [which is an exercise of understanding], it escapes notice whether they hold or not. Hence what admits of being known scientifically is of necessity. Hence it is eternal. For the things that are unconditionally necessary are all eternal, and eternal things cannot come to be or pass away” (NE VI 3 1139<sup>b</sup>19–24); “Everything perceptible has an unclear status whenever it is [away] from being perceived (*exô tês aisthêseôs*); for it is not evident whether it still holds true, because it is only through perception that this is known” (Top. V 3 131<sup>b</sup>21–23). The “actuality” referred to, as we see from these passages, is simply that of being actually or actively understood or perceived. See also Z 15 1039<sup>b</sup>27–1040<sup>a</sup>7.

Note 796

**The matter is intrinsically unknowable:** “We should take it as a general truth about all perception that a sense is what can receive perceptible forms without their matter, just as wax receives the imprint of the ring without the iron or gold” (DA II 12 424<sup>a</sup>17–20). “Of the understanding the activities are [acts of] understanding (*noêsaîs*), which are [acts of] seeing intelligible things (*horaseîs ousai noêtôn*)” (Protr. B24); “Understanding is a capacity for being such things [intelligible objects] without their matter” (DA III 4 430<sup>a</sup>7–8). It is not, then, that bronze or wood are unknowable but rather that what is known about them, as of anything, is always their formal component and not their material one. Matter as such is intrinsically unknowable because what perception and understanding can “receive” or “be” is always the form without the matter. Matter that is intrinsically featureless, and that might be considered unknowable for this reason, is discussed at Z 3 1029<sup>a</sup>20–21n, but is clearly not what is referred to here.

Note 797

**Intelligible matter (*hulê noêtê*) being the sort that is in the perceptible things but not insofar as they are perceptible:** *Hulê noêtê* is mentioned by name only

here, at Z 11 1037<sup>a</sup>5, and in H 6 (below), although *hé tôn mathēmatikôn hulê* (K 1 1059<sup>b</sup>15–16)---the matter of objects of mathematics---is fairly certainly a reference to the same sort of thing.

**Such as the objects of mathematics:** When a mathematician draws a particular equilateral triangle ABC in chalk on a blackboard, he uses it to represent an abstract particular equilateral triangle <ABC> whose sides are perfectly straight, exactly equal mathematical lines that have length but no breadth. <ABC> is a mathematical object. When he draws a second equilateral triangle DEF in order to prove that <ABC> and <DEF> are congruent, what distinguishes these two abstract mathematical triangles from each other is not their form or shape, which is the same in both, but their intelligible matters, which are different in each, and which are the abstract analogues <m<sub>1</sub>> and <m<sub>2</sub>> of the different parcels of perceptible matter, m<sub>1</sub> and m<sub>2</sub>, consisting of chalk and areas of blackboard, that distinguish ABC from DEF, since these are also the same in form (Z 8 1034<sup>a</sup>5–8). <ABC> and <DEF> are particular abstract triangles, just as Callias and Socrates are particular non-abstract humans. And as the universal human is a sort of compound of this form (defined by the account of human) and this matter taken universally (1035<sup>b</sup>27–30), so the universal mathematical triangle is a compound of the form (defined by the account of equilateral triangle) and something else. And what that something else is, is not <m<sub>1</sub>> or <m<sub>2</sub>>, which are distinct parcels of intelligible matter, but the abstract universal material of which they are instances---the analogue, in other words, of the non-abstract universal material of which m<sub>1</sub> and m<sub>2</sub> are distinct instances. It is this universal analogue---intelligible matter taken universally---that H 6 describes: “Some matter is intelligible, and some perceptible, and of the account always one part is the matter and the other the actuality [= the form]---for example, the circle is shape + plane (*ho kuklos schēma epipedon*)” (1045<sup>a</sup>33–35). Since “shape” is a common equivalent of “form” (for example, Δ 8 1017<sup>b</sup>25–26) we may infer that plane is the universal material component of the account or definition of the universal circle, and so of the universal equilateral triangle as well. It is thus a special case of intelligible matter. For what mathematicians leave behind when they do their abstracting from perceptibles is “only the quantitative and the continuous, sometimes in one, sometimes in two, sometimes in three dimensions, and the attributes of things insofar as they are quantitative and continuous” (K 3 1061<sup>a</sup>32–35). Intelligible matter taken universally, then, is the continuous---the abstract analogue of physical space that the quantitative divides up (notice “lines and the continuous” at Z 11 1036<sup>b</sup>9–10). The universal definitions of objects of mathematics are thus analogous to those of natural objects described at Z 5 1030<sup>b</sup>15–18.

#### Note 798

**The brazen right angle, and the one in particular lines are posterior to these:** The brazen triangle is a perceptible triangle; the triangle in particular lines is the intelligible one (1036<sup>a</sup>2–3, 9–12).

#### Note 799

**Yet if this is not clear, it is not possible to define each thing:** Compare E 1 1025<sup>a</sup>28–1026<sup>b</sup>6.

Note 800

**The bronze would still not belong to the form:** Reading ὁ χαλκός οὐδὲν τοῦ εἶδους with Ross and FP for ὁ χαλκός οὐδὲν μέρος τοῦ εἶδους (“the bronze is no part of the form”).

Note 801

**It is not proper to define these in terms of lines and the continuous:** See Z 10 1036<sup>a</sup>11n.

**All these too should be said of things in the way flesh and blood are of the human and bronze and stone of the statue:** “All these” refers to the circle, the triangle, and the line. The claim is that we should not define any of these as “a this in this”—this form or shape (triangle, circle, line) in this matter (the continuous). But rather just as we (supposedly) predicate the human (the form) of flesh and blood and the statue of bronze and stone, and define it by itself in separation from flesh and blood, so we should predicate circle, triangle, and line (the forms) of the continuous, but define them by themselves in separation from the continuous. Hence in the next sentence line too is defined in terms of numbers (forms) alone.

Note 802

**They lead everything back to numbers, and say that the account of line is that of the two:** “They” are probably Pythagoreans: “Some compose nature from numbers, as do some of the Pythagoreans” (*Cael.* III 1 300<sup>a</sup>16–17). In a text attributed to Speusippus and characterized as based particularly on “the writings of Philolaus,” we find an account of the line of the sort referred to: “The first starting-point of magnitude is the point, the second the line, third the surface, and fourth the solid” (*Theolegumena arithmeticae* 82.10 = Speusippus F28 *farán*). But the reliability of the text is uncertain. Whoever “they” are, the point is that they define line without reference to matter. See H 3 1043<sup>a</sup>33–34.

Note 803

**There is both one Form of many things whose forms are evidently distinct (which is just what followed for the Pythagoreans too):** See A 5 985<sup>b</sup>29–31.

**It will be possible to make one Form-itself of all things, and make the others not Forms—and yet in this way all things will be one:** See A 6 987<sup>b</sup>20–22, 9 992<sup>b</sup>9–13n, B 4 999<sup>b</sup>20–22.

Note 804

**Some things presumably are this in this (*toḗ en tó[i]de*):** See Z 5 1030<sup>b</sup>18n.

**Or these things in this state (*hōdi tadi echonta*):** See Z 10 1035<sup>b</sup>24–25.

Note 805

**The comparison in the case of animal that Socrates the younger used to make is not correct:** The precise nature of the comparison is otherwise unknown.

**Socrates the younger:** A follower of Socrates and a contemporary of Theaetetus. In later life he was a member of Plato’s Academy. He is one of the interlocutors in Plato, *Pol.* and is mentioned at *Tht.* 147d, *Sph.* 218b, *Ep.* 358d. Whether he was a mathematician is not entirely clear.



## Note 806

**The animal is something capable of perception:** Reading αἰσθητικὸν γάρ τι ἴσως τὸ ζῷον with FP for OCT αἰσθητὸν γάρ τι τὸ ζῷον (“the animal is something perceptible”). The OCT reading seems not to provide any basis for (4) below.

**And it is not possible to define it without movement, nor, therefore, without the parts being in a certain state:** (1) The animal is something capable of perception. (2) The animal cannot be defined without movement. (3) For perception involves movement or change (implicit). (4) Nor, therefore, can it be defined without parts (namely, organs of perception) that are in a certain state (namely, capable of perceiving). See also E 1 1026<sup>a</sup>3n.

## Note 807

**It is not the hand in any and every state that is a part of the human:** What is defined (“the animal” at 1036<sup>b</sup>29) must be the universal or species animal, not a particular animal, since particulars do not have definitions (Z 15 1039<sup>b</sup>27–29). Hence “the human” here must be understood in a parallel way as referring to the species not the particular.

## Note 808

**For there will be matter even of some things that are not perceptible and of everything that is not an essence:** Reading ἔσται γὰρ ὅλη ἐνίων καὶ μὴ αἰσθητῶν καὶ παντός ὃ μὴ ἔστι τί ἢν εἶναι with FP for OCT and Ross ἔσται γὰρ ὅλη ἐνίων καὶ μὴ αἰσθητῶν· καὶ παντός γὰρ ὅλη τις ἔστιν ὃ μὴ ἔστι τί ἢν εἶναι καὶ εἶδος αὐτὸ καθ’ αὐτὸ ἀλλὰ τόδε τι (“And in fact there is some sort of matter in everything that is not an essence and intrinsically a form, but a this something”). The contrast implicit in the Ross and OCT text is between being a form (or intrinsically an essence) on the one hand and being a this something on the other—a contrast that would presumably have to rely on the fact that the agreed upon substances (= this somethings) are matter-form compounds. For on Aristotle’s own view some forms are this somethings (Δ 8 1017<sup>b</sup>25–26n).

## Note 809

**The semicircles, then, will not be parts of the universal circle but will be parts of the particular ones, as was said before:** At Z 10 1035<sup>a</sup>1–22.

## Note 810

**While there is one sort of matter that is perceptible, there is another that is intelligible:** See Z 10 1036<sup>a</sup>10n.

## Note 811

**It is clear too that the soul is primary substance:** See Z 10 1035<sup>b</sup>14–16, H 3 1043<sup>a</sup>35–36.

## Note 812

**Some take him to be a soul others the compound:** “Bury me whatever way you like,” Socrates said, ‘provided you can catch me, and I don’t elude you.’ And laughing quietly and looking toward us, he said: ‘Gentlemen, I can’t persuade Crito that I am Socrates here, the one who’s talking to you now and setting out in order each

of the arguments put forward. He thinks I'm that corpse he'll see in a little while, and actually asks how to bury me!" (Plato, *Phd.* 115c2–d2).

Note 813

**As the universal is, so the particular is too:** See Z 10 1036<sup>a</sup>16–25, H 3 1043<sup>b</sup>2–4.

Note 814

**Whether there is, beyond the matter of these sorts of substances, another sort of matter:** See A 2 1069<sup>b</sup>24–26.

**Whether we should look for another sort of substance, such as numbers or something of that sort, must be investigated later:** In M and N.

Note 815

**In a certain way it is the function of natural science and secondary philosophy to have theoretical knowledge (*theôria*) of perceptible substances:** "Up to what point, then, must the natural scientist know the form and the what-it-is? Or like the doctor with nerve or blacksmith with bronze, isn't it up to the point at which [he knows] the for-the-sake-of which of each thing, and isn't he concerned with things that are separable in form, but are in matter? For human owes his begetting to human and to the sun. But the way the separable is, and the what-it-is, it is the function of primary philosophy to determine" (*Ph.* II 2 194<sup>b</sup>9–15). See E 1 1025<sup>b</sup>18–1026<sup>a</sup>23, Z 3 1029<sup>a</sup>30–33, <sup>b</sup>1–3, and, on the role attribute to the sun in reproduction, A 5 1071<sup>a</sup>13–17, GC II 10 336<sup>a</sup>31–337<sup>a</sup>15.

Note 816

**It is not only about the matter that the natural scientist must know but also about the substance that is in accord with the account—in fact more so:** "It is not enough to say from what things they [natural things] are composed—for example, composed of fire or of earth. Rather it is just as if we were speaking about a bed or any other such thing. We should try to determine the form of it rather than the matter—for example, the bronze or the wood. And if not, at any rate the matter [as being] of the compound. For a bed is this in this (*tode in tô[ide]*), or this of such-and-such sort (*tode toionde*), and so we would have to mention its configuration as well, and what sort of form (*idean*) it has. For the nature that is in accord with the shape [= form] is its nature more than the material nature is" (*PA* I 1 640<sup>b</sup>22–29). See also E 1 1026<sup>a</sup>5n.

Note 817

**The way the things in the account are parts in the case of the definitions, and why the definition is an account that is *one* . . . must also be investigated later:** See Z 12, H 6.

Note 818

**What the essence is, then, and what way it is intrinsically has now been stated universally where every case is concerned:** The cases are listed in Z 4 1030<sup>a</sup>17–<sup>b</sup>13.

Note 819

**For of the compound with the matter there is not an account (for it is indefinite):** Compounds are indefinite, that is, have no definitions (1036<sup>a</sup>28–29), but

they do have accounts “composed from an addition” (E 1 1025<sup>b</sup>28–1026<sup>a</sup>6, Z 5 1030<sup>b</sup>14–23). Matter, though, since it is without intrinsic attributes (Z 3 1029<sup>a</sup>20–26), and so is intrinsically unknowable (Z 10 1036<sup>a</sup>8–9), has no account.

**With respect to the primary substance there is [an account of the compound]—for example, of human, the account of the soul:** The primary substance of a compound is its form (Z 8 1032<sup>b</sup>1–2), the soul is the form of the compound (10 1035<sup>b</sup>14–16).

#### Note 820

**Indeed in these the nose will be present twice:** Reading δις γὰρ ἐν τοῦτοις ὑπάρξει ἡ ρίς with OCT and FP, which Ross brackets for deletion. The clause is important for our understanding of terms like “the snubness” and “the concavity.” For we see immediately that the nose is present twice in the snub nose (Z 5 1030<sup>b</sup>28–1031<sup>a</sup>1). But it is present twice in the snubness if and only if the snubness in question is the particular instance of (universal) snubness in the relevant nose. For it is only in that case that in saying what the snubness is we will have to spell it out as “the concavity in the nose (= snubness) in the (particular) nose.”

#### Note 821

**For example, in the case of the primary substances:** Reading ὥσπερ ἐπὶ τῶν πρώτων οὐσιῶν with OCT and FP. Ross reads ὥσπερ ἐπὶ τῶν πρώτων οὐσιῶν οἷον καμπυλότης καὶ καμπυλότητι εἶναι, εἰ πρώτη ἐστίν (“For example, in the case of primary substances, such as curvature and being for curvature, if this is a primary substance”). If we follow Ross, we will need to take Aristotle not as asserting that curvature is a primary substance, since it obviously is not one, but rather as asserting that it is like one, since it and its being or essence are the same (Z 6).

#### Note 822

**By a primary substance I mean what is not said to be by being one thing in another, that is, in an underlying subject as matter:** See Z 7 1032<sup>b</sup>1–2, Γ 3 1005<sup>a</sup>35n.

#### Note 823

**Nor are those that are one coincidentally:** Reading οὐδὲ κατὰ συμβεβηκὸς ἓν with FP for OCT οὐδ’ εἰ κατὰ συμβεβηκὸς ἓν (“nor are they the same if they are coincidentally one”).

#### Note 824

**Let us now, however, first speak—to the extent that we have not already discussed it in the *Analytics*—about definition:** The reference is to *APo.* II 3–10, 13. The primary topic is essence (Z 4 1029<sup>b</sup>12–13); definition is discussed because an account of an essence is a definition (H 1 1042<sup>a</sup>17–18).

#### Note 825

**The puzzle that was stated there:** At *APo.* 92<sup>a</sup>27–33 the puzzle is stated but not solved: “In both cases, both if you show (*deiknunta*) [= define] by division and if you thus produce a deduction in a way relative to it, there is the same puzzle: why will the human be terrestrial two-footed animal and not instead animal and terrestrial

and two-footed? For from what is assumed [namely, a definition by division] there is no necessity for what is predicated to become one, instead it might be like when the same human is musical and grammatical.”

Note 826

**Why on earth is something one when the account of it is what we call a definition?:** On the distinction between definitional and non-definitional accounts, see Z 4 1030<sup>a</sup>1–17.

Note 827

**Participate** (*metechei*): See Z 4 1030<sup>a</sup>13–14n.

**In the present case, by contrast** (*de*), **one does not participate** (*metechei*) **in the other**: The contrast is between (1) the pale human and (2) the two-footed animal. In (1) what are the analogs ( $\approx$ ) of the animal and two-footed? The natural thought, looking at the structure of the English terms, is this: (1a) pale  $\approx$  two-footed, while the human  $\approx$  the animal. In Greek, however, the two-footed animal is *zô[i]on diploun*—the animal [that is] two-footed. So another possibility is: (1b) pale  $\approx$  the animal, while the human  $\approx$  two-footed. In (1a) a pale human is, so to speak, a species of human, in (1b) it is a species of pale thing. In (2) animal (genus) does not participate in two-footed (differentia), since the account of two-footed does not apply to the generic animal, as is required for participation in the relevant sense (Z 4 1030<sup>a</sup>13n). In (1a), then, the contrast with (2) must be that the human does participate in pale, with the result that the account of pale must apply to the human. In (1b) the contrast with (2) is that pale does participate in the human, with the result that the account of the human must apply to pale. What coincides with the human, however, is not (except by proxy) the universal pale but the particular pale. And what it coincides with is not (except by proxy) the universal human but the particular human. So in (1a) the account of the pale (particular) must apply to the human (particular) and in (1b) the account of the human (particular) must apply to the pale (particular). But because the pale is a coincident of the human, the account of the pale cannot apply to the human (Z 4 1030<sup>a</sup>1–2). So (1a) is false. On the other hand, because the pale is a quality, dependent for its being on the being of the underlying subject (Z 1 1028<sup>a</sup>20–<sup>b</sup>2), the account of the human must apply to it, since it is of necessity *the pale human*, making (1b) the viable option.

Note 828

**The genus does not seem to participate in the differentiae**: “The differentia does not seem to participate in the genus. For what participates in the genus is always either a species or an individual (*atomon*), whereas the differentia is neither a species nor an individual” (IV 2 122<sup>b</sup>20–22). See also K 1 1059<sup>b</sup>33.

Note 829

**It is not because these are present in [one genus], since that way there will be one from all**: “These” refers to the differentiae, footed, two-footed, featherless. If what made these three one was simply their presence in one genus, all the differentia of that genus would also be one, so that, for example, two-footed and four-footed would be (parts of the same) one.

## Note 830

**The substance signifies one something (*hen ti*) and a this something (*tode ti*):** See B 6 1003<sup>a</sup>9-12, Γ 2 1003<sup>b</sup>32-33.

## Note 831

**We should first investigate definitions that are by division:** The other sort of definition is "the one that states a thing's components" (B 3 998<sup>b</sup>13-14), and so is of its matter rather than its form (H 2 1043<sup>a</sup>19-21). It is not in fact investigated in what follows.

## Note 832

**Said by means of more differentiae:** See Z 4 1029<sup>b</sup>19-20n.

## Note 833

**If, then, the genus is unconditionally nothing beyond (*para*) the species as species of a genus:** Suppose *G* is a genus whose species are  $S_1 \dots S_n$ . If *G* were unconditionally beyond  $S_1 \dots S_n$ , as a Platonic Form *F* is beyond the perceptible particular *F*'s that participate in it, then *G* would exist even if none of  $S_1 \dots S_n$  did. But that is impossible, since for *G* to exist, some particular animal, *A*<sub>1</sub> that is a member of *G* must exist (Δ 28 1024<sup>a</sup>29-31). But if *A*<sub>1</sub> is a member of *G*, it must be a member of  $S_1$  or  $S_2 \dots$  or  $S_n$ , since its definition must include not just *G* but some (ultimate) differentia, *D*<sub>1</sub>, which will place it in one of  $S_1 \dots S_n$ , since these are the only species of *G* there are.

**Or if it is, it is as matter (for the voiced sound is genus and matter, and the differentiae produce the phonetic elements from this):** (1) One way in which a genus *can* be unconditionally beyond the species produced from it by the differentia is by being some otherwise identifiable matter, such as a parcel of bronze, which can exist before (and after) it has been shaped into a statue of Hermes. The statue, then, belongs to the genus: things (statues) made of bronze. Voiced sound is like bronze in this regard (GA V 786<sup>b</sup>21), and the particular syllables like a particular statue of Hermes. (2) A second way is when the genus is matter by being the subject of which the differentia are predicated (Δ 28 1024<sup>b</sup>8-9, Iota 8 1058<sup>a</sup>37-<sup>b</sup>3). Understood in this way, however, the genus is not *unconditionally* beyond the species it is divided into by the differentiae, since the genus is the ultimate matter, and the ultimate matter and the form (the ultimate differentiae) are one and the same—the matter potentially, the form actually (H 6 1045<sup>b</sup>17-23).

## Note 834

**We should not say that of the footed there is on the one hand the feathered and on the other the featherless, on the contrary, it is through lack of ability that we will say this:** A reference to the need to be well educated before beginning an investigation (α 3 995<sup>a</sup>12n)—in this case, specifically in analytics (Γ 3 1005<sup>b</sup>3-4).

## Note 835

**At that point there will be precisely as many species of foot as there are differentiae, and the footed animals will be equal in number to the differentiae:** (1) "We should try to take the animals by genera, following the lead of ordinary

people in distinguishing between a bird genus and a fish genus. Each of these has already been defined by many differentiae, not by dichotomy. For by dichotomy either one cannot obtain them at all (for the same one falls into more than one division, and opposites fall into the same) or there will be only one differentia and this, either as a simple one or composed by interweaving, will be the ultimate species. If, on the other hand, we do not take the differentia of a differentia, it will be necessary, just as people make an account one by conjunction, to make the division continuous in that way too. I mean the sort of thing that comes about from dividing animals into the featherless and the feathered, and the feathered into the tame and the wild, or the pale and the dark. For neither the tame nor the pale is a differentia of the feathered, but is rather the starting-point of another differentia, and is coincidental here. That is why we should divide the one genus straightaway into many differentiae, as we say" (PA I 3 643<sup>b</sup>10-24).

(2) "By proceeding continuously [that is, taking a differentia of the differentia at each stage] we reach the ultimate (*eschatên*) differentia (though not the ultimate (*teleutaian*) differentia that is the species). And this is either the cloven-footed alone, if we are dividing human, or the whole complex (*sumplexis*)—for example, if we were to combine footed, two-footed, and cloven-footed. If the human were cloven-footed alone, by proceeding in this way, we would arrive at this one [ultimate] differentia. But since the human is not in fact like that, it is necessary for there to be many differentiae that are not under one division" (PA I 3 644<sup>a</sup>1-8).

(3) "If we want to grasp the species of animal, we should first determine what it is that every animal must have—for example, some of the perceptual organs, something with which to masticate and absorb food, such as a mouth and a stomach, and also parts by which it moves. If these were the only [necessary parts], but they were differentiated (I mean, for example, if there were several kinds (*genos*) of mouths, stomachs, and perceptual organs, and also of locomotive parts in addition), then the number of ways of combining these will necessarily produce several kinds (*genos*) of animals. For the same [species of] animal cannot have multiply differentiated [kinds] of mouths, nor of ears either. Hence, when these have been grasped, all the possible ways of pairing them together will produce species of animals, and as many species of animals as there are combinations of the necessary parts" (Pol. IV 4 1290<sup>b</sup>25-37).

The net effect of (1-3) is to make it clear that in our text Aristotle is simplifying things for the sake of clarity and economy of expression—something he has more-or-less advertised at 1038<sup>a</sup>1-3. Real animals must have more than one necessary part (A 1 980<sup>a</sup>28n), whereas the imaginary animals in the genus under discussion here have feet as their only necessary part, so that the differentiae of feet alone determine their species. The suggestion in (3) that each of the possible ways of combining the differentiated necessary parts is a distinct species needs to be tempered by the fact that not all such combinations need be so to speak viable—able to survive in some natural habitat: "There are indeed many kinds (*eidōs*) of food, because the ways of life of both animals and humans are also many. For it is impossible to live without food, so that differences in food have produced different ways

of life among the animals. For some beasts live in herds and others live scattered about, whichever is advantageous for getting their food, because some of them are carnivorous, some herbivorous, and some omnivorous. And so with a view to their convenience and their preference in these matters, nature has made their ways of life different. And since the same things are not naturally pleasant to each, but rather different things to different ones, among the carnivores and herbivores themselves the ways of life are different" (*Pol.* I 8 1256<sup>a</sup>19–29).

#### Note 836

**The ultimate differentia is the substance and the definition (*horismos*) of the thing:** A *horismos* is a *logos*. And just as *logos* is used in place of its ontological correlate ( $\Delta$  6 1015<sup>b</sup>25n)—namely, form, essence, or substance—*horismos* is used in that way here. The *horismos* is not the substance or the differentia, but rather is of the substance and is composed of the (name of) the ultimate differentia.

#### Note 837

**If we divide coincidentally—for example, if the footed were divided into the pale and the dark—there will be as many differentiae as there are cuts:** To divide coincidentally is to cut a differentia (the footed) into two sorts (the pale, the dark) by a pair of contraries (pale, dark) that are coincidents of the differentia—attributes whose definitions do not entail the differentia in the way that, for example, two-footed entails footed.

#### Note 838

**It is wasted work to say footed when two-footed has been said:** In English we would start with the ultimate differentia (two-footed) and work back (via footed) toward the genus (the animal). In Greek we start with the genus and work out to the ultimate differentia. Thus at 1038<sup>a</sup>22 the definition of the human = the animal + footed + two-footed. If we change the order, so that the ultimate differentia comes first (animal + two-footed + footed), we see immediately that adding footed is wasted work, since two-footed entails it. This is true no matter how many differentiae there are between the ultimate one and the genus.

#### Note 839

**And there is no order in the substance, since how could we understand one thing as being prior and another posterior:** The substance here is the essence of (for example) animal, to which the definition corresponds. If there were order in the essence, one element in it would be prior to another and that fact would have to be reflected in the definition. But an essence is "straightaway a one," which is why it can be a cause of the unity or oneness of the beings whose essence it is (*H* 6 1045<sup>b</sup>3–5). Hence there is no way to understand one element in it as prior or posterior to another. See also *Iota* 1 1052<sup>a</sup>29–34.

#### Note 840

**Just as the underlying subject and the essence are said to be substance, so also is the universal:** Reading λέγεται δ' ὡς περ τὸ ὑποκείμενον οὐσία εἶναι καὶ τὸ τί

ἢν εἶναι [καὶ τὸ ἐκ τούτων], καὶ τὸ καθόλου with FP. OCT includes the bracketed clause: “and the thing composed out of these.” But see Z 3 1029<sup>a</sup>30–31.

Note 841

**About two of these we have already spoken:** Z 3 (underlying subject); Z 4–6, 10–12 (essence).

**As the matter underlies the actuality** (*tê entelecheia[i]*): The word *entelecheia* is used previously in Z, at 9 1034<sup>b</sup>17 and 10 1036<sup>a</sup>7, but in neither case to refer to what the matter underlies, namely, the form (H 1 1043<sup>a</sup>2–28, M 3 1078<sup>a</sup>30).

Note 842

**The universal too seems to some people to be most of all a cause, and the universal most of all a starting-point:** Some people = Plato and the Platonists. See A 6 987<sup>b</sup>3 (universal), 18–19 (causes), 21 (starting-point, substance). On the connection between being a substance and being a cause, see Δ 8 1017<sup>b</sup>14–16.

Note 843

**The substance of each thing is special** (*idios*) **to it, in that it does not belong to anything else:** Reading οὐσία ἡ ἐκάστου ἰδίου ἐκάστου with FP and ἡ οὐχ ὑπάρχει ἄλλῃ with Bostock for OCT οὐσία ἐκάστου ἡ ἰδίου ἐκάστῳ, ἡ οὐχ ὑπάρχει ἄλλῳ (“the substance of each thing is what is special to it, which does not belong to anything else”). The specialness of the substance of X to X is a consequence of the identity between X and the substance of X (B 4 999<sup>b</sup>20–22, Z 6 1031<sup>a</sup>17–18, 16 1040<sup>b</sup>23–24), but this identity does not hold in all cases (Z 6 1032<sup>a</sup>10–11), but only in that of primary substances (11 1037<sup>a</sup>34–<sup>b</sup>7).

Note 844

**A universal, by contrast, is something common, since that thing is said to be a universal which naturally belongs to many things:** Aristotle has just reminded us that there are two ways of being an underlying subject: (1) being a this something that is the underlying subject for attributes; (2) being matter that is the underlying subject for form (1038<sup>b</sup>5–6). Since a universal naturally belongs to many things, that is, to many underlying subjects, we must ask whether these are this somethings or matter. And apparently they must be this somethings, since matter cannot be intrinsically many or “anything else by which being is distinguished” (Z 3 1029<sup>a</sup>20–21).

Note 845

**Then clearly there is some account of it:** Reading οὐκοῦν δῆλον ὅτι ἔστι τις αὐτοῦ λόγος with Ross and FP for OCT οὐκοῦν δῆλον ὅτι ἔσται τις αὐτοῦ λόγος.

Note 846

**It . . . will be the substance of that in which it is present as something special to it:** Reading ἐν ᾧ ὡς ἴδιον ὑπάρχει with Ross and FP for OCT ἐν ᾧ εἶδει ὡς ἴδιον ὑπάρχει (“it will be the substance of that species. . .”).

Note 847

**Neither in account nor in time nor in knowledge can the attributes be prior to the substance:** Reading οὔτε λόγῳ γὰρ οὔτε χρόνῳ οὔτε γνώσει with FP for OCT



οὔτε λόγῳ γὰρ οὔτε χρόνῳ οὔτε γενέσει (“neither in account nor in coming to be nor in knowledge”). See Z 1 1028<sup>a</sup>32–33n.

#### Note 848

**In Socrates substance will be present, and so it will be the substance of two things:** See B 6 1003<sup>a</sup>9–12.

#### Note 849

**There is not some animal—or any other of the things in the account—beyond the particular ones (*ta tina*):** In illustrative example introduced at 1038<sup>b</sup>18, the animal that appears in the substance of the human or the horse is the genus, “the particular ones” beyond which there is not “some animal” are probably the particular species, the human and the horse, not Socrates or Bucephalus.

#### Note 850

**If not, many other difficulties result, and especially the *Third Man*:** See A 9 990<sup>b</sup>17n.

#### Note 851

**It is impossible for a substance to be composed of substances that are actually present in it:** (1) Suppose  $S_1$ ,  $S_2$ , and  $S_3$  are substances. The claim initially seems to be: (1a) If  $S_1$  and  $S_2$  compose  $S_3$ , then  $S_1$  and  $S_2$  cannot be actually present—or present as actualities—in  $S_3$ . The argument in support of the claim, however, suggests that it is not (1a) that is intended, but rather the weaker claim: (1b) If  $S_1$  and  $S_2$  compose  $S_3$ , and  $S_1$ ,  $S_2$ , and  $S_3$  are substances belonging to the same kind  $K_1$ , then  $S_1$  and  $S_2$  cannot be actually present—or present as actualities—in  $S_3$ . For the argument is that if, for example,  $S_1$ ,  $S_2$ , and  $S_3$  are all of the same kind, namely, lines, then  $S_1$  and  $S_2$  cannot be present as actualities in  $S_3$ , since, if they were,  $S_3$  would actually be two lines, not one. Similarly, Democritus is praised for noticing not (1a) but (1b), since what he claims is that if  $S_1$ ,  $S_2$ , and  $S_3$  are all of the same kind, namely, atoms, then  $S_1$  and  $S_2$  cannot be present as actualities in  $S_3$ , since, if they were,  $S_3$  would actually be two atoms, not one. Later, in summarizing the present discussion, the claim is made without the qualification “actually” (Z 16 1041<sup>a</sup>4–5), which is clearly crucial to the argument given for it, whether understood as (1a) or as (1b).

(2) When Aristotle puts the claim to use at 1039<sup>a</sup>14–19, on the other hand, he seems to presuppose (1a). For the argument is that if a substance cannot be composed of universals or of substances, then every substance will be incomposite. But this would not be true, it seems, if—as (1b) allows—a substance of kind  $K_1$  could be composed of substances of kind  $K_2$ . This argument, however, is one that leads to a puzzle: definition is only or exclusively of substance, but if substances are incomposite, they seem to be indefinable. The question we must ask, therefore, is what happens to it when the puzzle is resolved.

(3) The lines and atoms given as examples in relation to (1a/b) are taken to be substantial particulars. But no such particulars have definitions, and so none can be substances (on the supposition that definition is only or exclusively of substance). That is the upshot of Z 11. Whatever at the end of the day (1a/b) applies

to, then, it cannot be to things like lines, atoms, or other matter-form compounds. That is the first point to notice. Second, consider the case of the syllable BA. It is composed of the letters A and B—making it a violation of (1a), though not of (1b) on the assumption that if syllables are serving as examples of substances, so are letters. But it is not *exclusively* composed of them (Z 17 1041<sup>b</sup>11–33). (1b), we can now see, by demanding that composed and composing substances be of different kinds, was tacitly presupposing that the composed substance, by being of a different kind, must involve something beyond the composing ones, namely, a new formal element that is the very substance of the composed one (H 3 1043<sup>b</sup>4–14).

(4) Summing up. The claim that a substance cannot be composed of substances should be understood as (1b) not as (1a). (This has obvious bearing on the status of complex things such as universes and cities, which have matter-form compounds (human beings) as parts.) Moreover, it should also be understood not as a final statement of secure doctrine, but as a stage in an investigation of substance that is not as yet complete. When that investigation is complete, the claim will be revisited, and (1a) will then turn out to be true at least of some substances: “no substance is eternal except activity, and if the elements are matter of what is a substance, then no eternal substance can be composed of elements present in it” (N 2 1088<sup>b</sup>26–28).

#### Note 852

**If the substance is one, it will not be composed of substances present in it and present in the way Democritus rightly states:** “Leucippus and Democritus of Abdera . . . say that the primary magnitudes are unlimited in number and indivisible in magnitude, and that many cannot come to be from one nor one from many, but that by the weaving together and entanglement all other things come to be” (*Cael.* III 4 303<sup>a</sup>3–8; also *GC* I 8 325<sup>a</sup>34–<sup>b</sup>5).

#### Note 853

**There is no unit actually present in it:** Reading ἡ οὐκ ἔνεστι μὴδὲ ἐν αὐτῇ ἐντελεχεία with FP for OCT ἡ οὐκ ἔστι μὴδὲ ἐν αὐτῇ ἐντελεχεία (“there is not a unit in it actually”).

#### Note 854

**It was said long ago that definition is either of substance only or of it most of all:** See Z 4 1030<sup>a</sup>2–17.

#### Note 855

**What is being said will be more clear on the basis of what comes later:** See especially Z 15 and H 6.

#### Note 856

**Those who say that the Ideas are substances:** See, for example, A 6 987<sup>b</sup>21, 9 990<sup>b</sup>34, Z 2 1028<sup>b</sup>20.

**That are separable:** See A 9 991<sup>b</sup>2, 992<sup>a</sup>26–29, Z 16 1040<sup>b</sup>27–34, M 4 1078<sup>b</sup>30–32, 10 1087<sup>b</sup>7–11. On what separability amounts to for substances, see Z 1 1028<sup>a</sup>34n.

**Make the Form be composed of the genus and the differentiae:** See H I 1042<sup>a</sup>15–16. The Platonic Forms or Ideas (*eidōs, idea*) in focus in this chapter are in particular those of animal species (*eidōs*).

#### Note 857

**If [1] the animal that is both in the horse and in the human is one and the same, just as you are one and the same as yourself, [1a] how will what is present in separate things be one, and why will this animal too not be separate from itself?:** The argument seems simple. (1) The human (species) = the animal<sub>1</sub> + differentia<sub>1</sub>. (2) The horse (species) = the animal<sub>2</sub> + differentia<sub>2</sub>. (3) The human species is separate from (that is, ≠) the horse species. (4) Therefore the animal<sub>1</sub> ≠ the animal<sub>2</sub>. The problem is that (4) seems not to follow from (3), since non-identical things can have some identical parts, in the way two football teams can share a player. So (4) is false and the animal<sub>1</sub> = the animal<sub>2</sub>. Separability of species involves not just their non-identity, however, but their ontological independence (Z 15 1040<sup>a</sup>15–22). So (3) should be understood as claiming that the human species is ontologically independent of the horse species, since each can exist without the other. Suppose, then, that the animal<sub>1</sub> = the animal<sub>2</sub> = the animal<sub>n</sub> for all n species of animal that there are. If all n species are destroyed, it can continue to exist. But just as an animal species cannot exist if there are no particular animals of that species extant, it seems plausible to think that the same is true of the animal genus. If that is so, then (4) does follow from (3), and our initial objection is undermined.

#### Note 858

**Are they perhaps combined and making contact (*sugkeitai kai haptetai*) or mixed together (*memiktai*)? Yet all of these are absurd:** (1) “Combined and making contact” contrasts with (2) “mixed together,” since the first involves mere juxtaposition of parts, whereas the second is “unification of the mixables, resulting from their alteration” (GC I 10 328<sup>b</sup>22; also A 8 989<sup>b</sup>2n). (1) is excluded because the two-footed cannot be separated out into the two-footed and the animal, since the two-footed = the two-footed animal (Z 12 1038<sup>a</sup>18–26). (2) is excluded because when we have a two-footed animal we do not have the two-footed in a condition that is altered by its being mixed with the animal (as sodium is altered by its mixture with chlorine), since the two-footed is by its very essence the two-footed animal.

#### Note 859

**[2] suppose the animal is a distinct thing in each, then there will be (one might almost say) an unlimited number of things whose substance is animal:** For each animal species, there will be a distinct animal genus, so that no two species can belong to the same animal genus. This threatens the very idea of definition by genus and differentia, and with it the view that the Forms can be composed of the genus and the differentia (1039<sup>a</sup>26). See also A 9 990<sup>a</sup>34–8.

#### Note 860

**Nothing will be the Idea of one thing and the substance of another, since that is impossible:** The Idea or Form of A = the substance of A (A 9 991<sup>b</sup>2); the substance of A = substance of B  $\supset$  A = B (B 4 999<sup>b</sup>21–22).

Note 861

**Each of the animals present in the various [species] of animals will be animal-itself:** Reading αὐτὸ ἄρα ζῶον ἐν ἑκαστον ἔσται τῶν ἐν τοῖς ζώοις with FP for OCT αὐτὸ ἄρα ζῶον ἐν ἑκαστον ἔσται τῶν ἐν τοῖς ζώοις (“each of the animals present in the various [species] of animals will be one animal-itself”).

Note 862

**How can this animal, whose substance is this itself, be beyond the animal-itself?:** We have a series of animal species  $S_1 \dots S_n$ , in each of which there is, as its genus, a distinct animal—the animal<sub>1</sub> . . . the animal<sub>n</sub>. The animal<sub>1</sub> = animal-itself<sub>1</sub>, because the animal<sub>1</sub> is the substance of  $S_1$ , and what is the substance of  $X$  is the Form of  $X$  ( $X$ -itself). The same is true for  $S_n$ . The animal-itself, however, is unique (A 6 987<sup>b</sup>17–18). The question is, how is it related to animal-itself<sub>1</sub> or any of the others. It cannot be identical to them, because it is one and they are many—besides, if it were identical to them, they would be identical to each other (previous note). But it cannot be separate from them either, since it is their substance, and a substance cannot be separate from what it is the substance of (991<sup>a</sup>1–2).

Note 863

**The first is substance in this way, as the account combined with the matter, whereas the other is wholly the account:** Reading ὁ λόγος ὁλῶς with Ross and FP for OCT ὁ λόγος ἀπλῶς (“as simply or unconditionally the account”). The meaning is pretty much the same on either reading. “The account” here refers to the form, which is more properly the ontological correlate of the account. See A 6 1015<sup>b</sup>25n.

**Of the account—in the sense of being in the process of passing away—there is none, since there is no coming to be either (for the being for the house does not come to be, but the being for this house):** See H 3 1043<sup>b</sup>14–23. The same is true of points, lines, surfaces (B 5 1002<sup>a</sup>32–<sup>b</sup>11, H 5 1044<sup>b</sup>21–22), and points of contact (Cael. I 11 280<sup>b</sup>25–28).

Note 864

**It has been shown that no one begets or makes the accounts:** A clear reference to Z 8. For its significance, see Z 7 headnote and next note.

Note 865

**This is also why (*dia touto de kai*) there is neither definition nor demonstration of the substances that are perceptible and particular:** If *touto* (“this”) is taken to refer back, the most natural reference is to the sentence (1039<sup>b</sup>23–24) that precedes the reference to Z 8 (1039<sup>b</sup>25–26), suggesting that the latter may be a later addition. But *touto* can be understood to refer forward to what immediately follows. This is how it is understood in the translation. Hence the addition of “namely,” which makes this explicit.

Note 866

**If demonstration is of the necessary things and definition is a matter of scientific knowledge . . . then it is clear that there will not be either definition or**

**demonstration of particular perceptible substances:** If we are “to speak in an exact way and not be guided by mere similarities,” we should not call anything a science unless it deals with eternal truths about universals that are wholly necessary and do not at all admit of being otherwise (NE VI 3 1139<sup>b</sup>19–21). It is science in this sense, which the *Posterior Analytics* calls *epistēmē haplōs* (“unconditional scientific knowledge”)—and not in other less demanding ones (A 1 981<sup>a</sup>3n)—that we cannot have of perceptible particulars: “There is neither [unconditional] demonstration nor unconditional scientific knowledge of what is perishable, but only the coincidental sort, because it does not hold of this universally, but at some time (*pote*) and in some way (*pōs*)” (APo. I 8 75<sup>b</sup>24–26).

**If definition is a matter of scientific knowledge:** Reading ὁ ὁρισμὸς ἐπιστημονικόν with Ross and FP for OCT ὁ ὁρισμὸς ὁ ἐπιστημονικόν. Whether definition is a scientific matter depends on what sort of definition it is: “Since a definition is said to be an account of what something is, it is evident that one sort will be an account of what its name, or some other name-like account, signifies—for example, what triangle signifies. . . . Another sort of definition is an account that makes clear why it exists. So the former sort signifies something but does not show it, whereas the latter will evidently be like a demonstration of what it is, differing in arrangement from a demonstration. For there is a difference between saying why it thunders and saying what thunder is. In the first case you will say: because fire is being extinguished in the clouds. And what is thunder? The loud noise of fire being extinguished in the clouds. Hence the same account is given in different ways. In one way it is a continuous demonstration, in the other a definition. Further, a definition of thunder is a noise in the clouds, and this is a conclusion of the demonstration of what it is. The definition of an immediate item, though, is an indemonstrable positing (*thesis*) of what it is” (APo. II 10 93<sup>b</sup>29–94<sup>a</sup>10); “The definitional account must not only make clear ‘the that,’ which is what most definitions state, but must also include the cause and make it evident. As things stand, though, definitional accounts are like conclusions. For example, What is squaring? Making an equilateral rectangle equal to one that is not equilateral. But such a definition is an account of the conclusion, whereas the one that says that squaring is the finding of the mean proportional states the cause of the thing” (DA II 2 413<sup>a</sup>13–20).

Note 867

**Things that pass away are unclear to those who have scientific knowledge, when they have departed from perception:** See Z 10 1036<sup>a</sup>2–7.

Note 868

**That is why, in issues relating to definition (*tôn pros horôn*), when someone is defining one of the particular things, we must not be ignorant of the fact that it is always possible to do away with this definition, since particulars cannot be defined:** The remark is analogous to others made in the *Topics* about how to refute definitions: “Next we must investigate issues concerning the genus and the special attribute (*to idion*) [see M 3 1078<sup>a</sup>8n], since these are elements in those issues that relate to definitions (*tôn pros tous horous*), although dialecticians seldom take these by themselves as the objects of their investigation” (IV 1 120<sup>b</sup>11–15). The

imagined context is thus dialectical (Γ 2 1004<sup>b</sup>19n). An opponent has put forward a definition of a perceptible particular. It can be done away with or overthrown by adverting to the opponent's ignorance of the present state of the definiendum, now that it is no longer being perceived.

Note 869

**Nor indeed (*dê*) can any Idea be defined:** The argument that perceptible particulars cannot be defined relies not on their particularity but on their susceptibility to change. Since Ideas are intelligible objects that are immune to change (A 6 987<sup>a</sup>32–<sup>b</sup>10), Aristotle can hardly be using *dê* (which can mean “then” or “therefore”) to draw an inference. Instead *dê* indicates transition to a new topic while sounding (another use of *dê*) a note of irony: Ideas—the very things introduced to be the ontological correlates of definitions and starting-points of demonstrations!—turn out to be no more definable than the perceptible particulars they were introduced to replace (M 4 1078<sup>b</sup>12–30).

Note 870

**For the Idea is a particular, so they say:** See M 10 1086<sup>b</sup>7–11.

**And separable:** See M 4 1078<sup>b</sup>30–32.

Note 871

**Nothing prevents all these taken separately from belonging to many things, but taken all at once they belong only to this one:** A view that Aristotle accepts about definitions of universals (Z 11 1036<sup>a</sup>26–19): “Such things [attributes] must take up the first point at which just so many are taken that each will belong further but all of them together will not belong further; for necessarily this will be the substance of the thing [being defined]” (APo. II 13 96<sup>a</sup>32–35). The shift from names as components of definitions to *nominata* is harmless (again, see Δ 6 1015<sup>b</sup>25n).

Note 872

**They also belong to both components—for example, the two-footed animal [TA] belongs to the animal [A] and to the two-footed [T]:** [1] We might think that TA belongs to A because (roughly) every T is an A: if something is two-footed it is an animal. But that way of conceiving the matter does not explain why TA belongs to A: if something is an animal it is not necessarily two-footed. When T, A, and TA are Ideas, however, what makes it true (indeed, necessarily true) that TA belongs to A and to T is that A and T are parts of, prior to, and separate from the compound (1040<sup>a</sup>17–19). This suggests that Aristotle's argument here is modeled on that at B 6 1003<sup>a</sup>10–12: “No common thing signifies a this something, but rather a such-and-such sort of thing, whereas substance is a this something. And if we are to posit that what is predicated in common is a this something and can be set out, then Socrates will be many animals: himself and the human and the animal—if indeed each of these signifies a this something and one thing.” TA belongs to A, then, just as animal belongs to Socrates (so that Socrates will be the animal), because TA is A. But TA and A are particulars (since Ideas are particulars), and so TA is A can only mean—as with Socrates and the animal—that TA = A. Similarly

for  $TA^*$  and  $I^*$ . Reverting to names, then, the name “TA” belongs to TA, and so, since  $TA = A = T$ , it belongs to A and T as well. Because A, T, and TA are all Ideas and Ideas are eternal things, the relations between them hold necessarily. But if Socrates were defined as the pale animal, the corresponding relations between him and the pale would be contingent. The remainder of the paragraph (1040<sup>a</sup>17–27) drives this conclusion home.

#### Note 873

**The impossibility of defining [particulars] escapes notice in the case of eternal things, especially those that are unique—for example, the sun and the moon:** The sun and moon are thought to be eternal substances, which are more familiar to us than Ideas or Forms (Z 2 1028<sup>b</sup>13, 15 1041<sup>a</sup>1). The apparent definability of them (though based on error) makes us think that Forms can also be defined.

#### Note 874

**For people err by adding the sort of things whose removal would leave it still being the sun, such as “going around the earth” or “being hidden at night”:** The quoted phrases may come from a lost part of Parmenides’ poem or from some other unknown poem.

#### Note 875

**It is evident that even of the things that seem to be substances, most are capacities:** See Z 2 1028<sup>b</sup>8–13, and, on capacities or potentialities, B 6 1003<sup>a</sup>1.

**None of the parts of animals is when it has been separated:** See Z 10 1035<sup>b</sup>22–25.

**For none of the elements is one, but instead they are like a heap, until they are concocted and some one thing comes to be from them:** The simplest beings in the Aristotelian world besides the sublunary elements (earth, water, fire, and air) are homoeomerous or uniform stuffs, such as water, wood, olive oil, flesh, and bone, whose parts have the same account as the whole (GC I 1 314<sup>a</sup>20, 10 328<sup>a</sup>10–12). These are composed out of the elements in some ratio, when the productive capacities (hot, cold) in the latter master the corresponding passive ones (dry, wet) (*Mete.* IV 1 378<sup>b</sup>26–379<sup>a</sup>1). Concoction (*pepsis*) is the fundamental form of such mastery, responsible for producing a uniform stuff, and for preserving its nature thereafter: “Concoction is a completion effected by a thing’s own natural heat from the corresponding passive capacities, these being definitive of the matter proper to the thing. For when a thing has been concocted it has been completed and brought into being. Moreover, the starting-point of the completion is the thing’s own proper heat. . . . The end of the process of concoction is the thing’s nature—but nature in the sense of form, that is, substance. . . . Concoction, then, is what everything undergoes when its matter—that is, its moisture—is mastered. For this is what is given definition by the thing’s natural heat, and as long as the defining ratio exists in it, it possesses its nature” (IV 2 379<sup>b</sup>18–35). Natural heat is thus formative heat—the cause in nature partly responsible for the coming to be and preservation of matter-form compounds. It is in naturally warm blood, for example, that the movements responsible for transmitting a male’s form to his various parts, to his seed (a concocted blood product), and to his offspring are encoded (Z 9 1034<sup>a</sup>34n).

Note 876

**The parts of animate things, and the parts of the soul close to them, turn out to exist in both ways, namely, both actually and potentially, due to having starting-points of movement deriving from something in their joints:** “What produces movement in an instrumental way is found where a starting-point and an end are the same, as, for example, in a hinge or ball-and-socket joint, since there the convex and concave are respectively the end and the starting-point of movement (that is why the one [the concave socket] remains at rest while the other [the convex ball] moves), the two being different in account, but not spatially separate. For everything is moved by pushing and pulling. Hence just as in the case of a circle or sphere, so here there must be a point that remains fixed, and the movement must have it as starting-point” (DA III 10 433<sup>b</sup>21–27).

**Which is why some animals go on living when divided:** “It is apparent that plants and, among animals, some insects go on living when divided, implying that each of the segments has a soul that is the same in form but not in number, since both segments for a period of time have perception and the capacity for movement with respect to place. But it is not strange that this does not last. For they do not have the instrumental parts that enable it to preserve its nature” (DA I 5 411<sup>b</sup>19–24; also II 2 413<sup>b</sup>13–24).

Note 877

**All the same, when they are one and continuous by nature, rather than by force or by growing together (*sumphusei*), these will all exist potentially:** Growing together may sometimes be a completely natural process (Δ 4 1014<sup>b</sup>20–26), resulting in a natural unity (Θ 1 1046<sup>e</sup>28). But it is also a process that can lead to such things as Siamese twins: “Most monsters (*terata*) are due to embryos growing together” (GA IV 4 773<sup>a</sup>3–4).

Note 878

**The latter sort of thing is a disability (*pêrôsis*):** See Z 9 1034<sup>b</sup>1n.

Note 879

**Since something is said in the same ways to be one and to be:** See Γ 2 1003<sup>b</sup>22–33. **Things whose substance is one in number are one in number:** See Z 6 1031<sup>a</sup>17–18, 13 1038<sup>b</sup>9–10, 14–15.

Note 880

**Being and one are in fact substance to a higher degree than are starting-point or element or cause:** The substance or essence of X is what X is intrinsically or in relation to itself (Z 4 1029<sup>b</sup>14–16), but X is a starting-point or element not intrinsically but in relation to the other things of which it is starting-point and element.

Note 881

**The substance belongs to nothing but itself and what has it, of which it is the substance:** See Z 13 1038<sup>b</sup>10n.



## Note 882

**No universal exists separately, beyond the particulars:** If a universal were separate, and so a particular (K 10 1086<sup>b</sup>16–19), it could not (wholly) belong in many places at the same time.

## Note 883

**So they make them the same in kind as perishable things** (for these we do know), **man-itself and horse-itself, adding to the perceptible ones the word “itself”:** See B 2 997<sup>b</sup>8–12, K 10 1086<sup>b</sup>7–11.

## Note 884

**No substance is composed of substances:** See Z 13 1039<sup>a</sup>3–4n.

## Note 885

**What, and what sort of thing:** See Δ 28 1024<sup>b</sup>5n.

## Note 886

**The substance is some sort of starting-point and cause:** Substance was first mentioned in the *Metaphysics* as being a starting-point and cause (A 3 983<sup>a</sup>27–29), and subsequently singled out as the sort that “no one has presented in a perspicuous way” (7 988<sup>a</sup>34–35).

## Note 887

**That something is the case and that it exists—that should [already] be clear:** “To inquire into what something is without grasping that it exists, is to inquire into nothing” (*APo.* II 8 93<sup>a</sup>26–27). See also B 2 997<sup>a</sup>5–8n. What exists is here the moon, and what is the case is that it is eclipsed. See H 4 1044<sup>b</sup>9–15n.

## Note 888

**But that at any rate is common to all cases and too concise** (*suntomon*): “If [a style of speaking] is babbling it is not perspicuous, nor if it is too concise” (*Rh.* III 12 1414<sup>a</sup>25–26). The criticism, therefore, is that the explanation offered is too concise to be perspicuous (A 4 985<sup>a</sup>13n).

## Note 889

**Why is this—or rather this body in this state—a human?:** Reading ἀνθρωπος τοῦ, ἢ τὸ σῶμα τοῦτο ὥδι ἔχον with FP for OCT ἀνθρωπος τοῦ, ἢ τὸ σῶμα τοῦτο τοῦ ἔχον (“Why is this—or rather this body having this—a human?”).

## Note 890

**In the case of things [said] simply there is neither inquiry nor teaching, but instead another way than inquiry belongs to them:** See Θ 10 1052<sup>b</sup>17–1052<sup>a</sup>4. Teaching: See A 1 981<sup>b</sup>7n.

## Note 891

**And something else again:** Reading ἐτι ἄλλου with Ross and FP for OCT ἔ τι ἄλλου.

Note 892

**Composed by nature:** Reading *καὶ φύσει συνεστήκασι* with Ross and FP. OCT brackets *καὶ φύσει* for deletion. Notice that this account of substance seems to entail that entities such as cities, which are "composed in accord with nature" (*Pol.* VII 8 1328<sup>a</sup>22-25), are substances, even though they have substances as actual parts (III 1 1274<sup>b</sup>39-40). This has obvious consequences for the interpretation of the claim at Z 10 1039<sup>a</sup>3-4 that "it is impossible for a substance to be composed of substances that are actually present in it."

BOOK ETA (VIII)

Note 893

**The agreed upon ones (*homologoumenai*) are the natural ones:** Substance "seems" to belong most of all to natural bodies and other (by implication) natural things (Z 2 1028<sup>b</sup>8-11) but does not in fact do so (16 1040<sup>b</sup>15-16). But since the agreed upon ones are at least substances *potentially* (1042<sup>a</sup>27-28, H 6 1045<sup>a</sup>20-<sup>b</sup>23), Aristotle does not reject the received view outright but rather preserves in his own the grain of truth that it has in it, as good dialectical method requires a philosopher to do (I 2 1004<sup>b</sup>19n).

Note 894

**The universal more substance than the particulars:** See A 1 981<sup>a</sup>16n.

Note 895

**It is with reference to the same argument that they seem to be substances:** See Z 13 1038<sup>b</sup>6-8 (compare A 6 987<sup>b</sup>1-19, 988<sup>a</sup>7).

Note 896

[1-10]: [1] A 1-2 982<sup>a</sup>1-6, E 1 1025<sup>b</sup>3-7, Z 16. [2] Z 2. [3] Z 4-11. [4] Z 3, with some important comments in Z 8. [5] Mentioned at Z 3 1028<sup>b</sup>34-35, 1030<sup>a</sup>11-12, with relevant material in Z 12 1037<sup>b</sup>29-1038<sup>a</sup>9. [6] Mentioned at Z 3 1028<sup>b</sup>34-35. [7] Z 12-13. [8] Z 4-5 1030<sup>a</sup>6-1031<sup>a</sup>14, Z 12. [9] Z 10-11. [10] Z 13. [11] is briefly discussed in Z 11 1037<sup>a</sup>11-13 and more fully in M and N.

Note 897

**By the matter I mean what, not being actively (*energeia*[i]) a this something, is potentially a this something:** As noted in connection with B 1 996<sup>a</sup>11, *energeia*[i] is often, as here, equivalent in meaning to *entelecheia*[i]—"actually." See H 2 1042<sup>b</sup>10n.

Note 898

**For of substances that are in accord with the account some are separable and some are not:** See Δ 8 1017<sup>b</sup>24-26n, Z 1 1028<sup>a</sup>34n, 10 1035<sup>b</sup>14-31, 11 1037<sup>a</sup>5-10.

Note 899

**If a thing has matter for change of place (*hulên topikên*), it is not necessary that it also have it for coming to be and passing away:** Perceptible matter comes in

a variety of different sorts. (1) Movable matter (*kinêtê hulê*), mentioned at Z 10 1036<sup>a</sup>10, is the sort something needs if it is to be capable of moving from place to place. Hence it is referred to here as *hulê topikê*. (2) Matter for alteration (*alloiôtê*) is the sort that things need if they are to change in quality (© 8 1050<sup>b</sup>16–8). (3) Then there is matter needed for movement with respect to magnitude, or growth and withering (*auxêtê kai phihitê*) (Ph. VIII 7 260<sup>a</sup>27). (4) And finally the matter needed for coming to be and passing away (*gennêtê kai phthartê*), which is most of all and in the full sense matter (GC I 4 320<sup>a</sup>2). Things that have (1) but not (4) include the various heavenly bodies (© 8 1050<sup>b</sup>22–28, A 2 1069<sup>b</sup>24–26).

#### Note 900

**What the difference is between unconditional coming to be and coming to be that is not unconditional has been stated in our works on nature:** “Change with respect to contradiction from not underlying subject to underlying subject is a coming to be, and it is an unconditional coming to be if the change is unconditional, otherwise a change of something in some respect. For example, a change from not pale to pale is a coming to be of that sort, but that from unconditional not being to substance is an unconditional coming to be, due to which we say that a thing has unconditionally come to be and not that it has come to be something. And a change from underlying subject to not underlying subject is a passing away, an unconditional one if it is from the substance to its not being, and one in some respect when the change is to the opposed denial, as we said in the case of coming to be” (Ph. V 1 225<sup>a</sup>13–20).

#### Note 901

**It remains to say what substance—as activation (*hôs energeian*)—of the perceptibles is:** (1) The term *energeia* is an Aristotelian coinage, which I have translated as “activation,” when, as here, it is being predicated of something, and as “activity,” when it is not. The dative or adverbial form *energeia[i]* is translated as “active” or “actively,” in order to signal its relation to *energeia*. The etymology of the coinage is unclear, but Aristotle is explicit that *energeia* has been extended from movement to other things (© 1 1046<sup>a</sup>1–2, 3 1047<sup>a</sup>30–32), and that it is related to another term with an *erg-* root, namely, *ergon*: “[the *ergon* (‘function,’ ‘work’) is the *telos* (‘end’), and the *energeia* is the *ergon*, and that is why the name *energeia* is said [of things] with reference to the *ergon* and extends to the *entelecheian* (‘actuality’)” (8 1050<sup>a</sup>21–23). *Entelecheia*, which is mostly used as a synonym of *energeia*, but with a slightly different connotation, is also an Aristotelian coinage: *energeia* is action, activity, and movement oriented; *entelecheia*—as the *tel-* suggests—is end or *telos* or completion (*enteles*) oriented (Δ 16 1021<sup>b</sup>24–30). The dative or adverbial form *entelecheia[i]* is translated as “actual” or “actually.” The *energeia* of is translated as “the activation of” and *entelecheia* of as “the actualization of.” Putting all this together: the activation or actualization of X is an activity, which is X active or actual, which is X achieving its end, which—since “the for-the-sake-of-which is the function” (B 2 996<sup>b</sup>7)—is X fulfilling its function, and being actively or actually X.

(2) *Energeia* occurs in early works such as the *Protrepticus*, which speaks of the *energeia* of understanding (B24, 86, 91), contrasts living *kata dunamin* with

living *kat' energeia* (B79), the single *energeia* of simple beings with the multiple *energeiai* of complex ones (B64), identifies full being with *energeia* (B83, 86), and refers to “complete and unimpeded *energeia*” as having enjoyment included within itself (B88). It continues to be used for these and related purposes throughout Aristotle’s works, in fact, where it occurs 671 times—almost five times as often as *entelecheia*, which occurs 138 times. The one place where *entelecheia* is used to the total exclusion of *energeia* is Z. By contrast there are only two occurrences of it in H (3 1044<sup>a</sup>9, 6 1045<sup>b</sup>17), and six in Θ. This makes it natural to wonder why, with *energeia* already at his disposal, Aristotle bothered to introduce an entirely new term with a very similar application. One suggestion is that the need stems from psychology. Aristotle has to distinguish (a) a dead animal from an animate one and (b) a dormant or sleeping live animal from an active or awake one. *Energeia* recommends itself for (b). But how, then, to distinguish the level of activity in (a) that constitutes the possession of a soul? That is where *entelecheia* supposedly comes in: the soul is “the first *entelecheia* of a natural body that has instrumental parts” (DA II 2 412<sup>a</sup>27–<sup>b</sup>6). This may well be true, but it is interesting that in a case where *energeia* seems yet more unfortunate in its connotations, Aristotle uses it anyway: “What is stillness? Quietness in a large quantity of air. The air is matter; the quietness is *energeia* and substance” (1043<sup>a</sup>23–24). In fact, he also uses it for the soul, which is the *energeia* of a certain sort of body (H 3 1043<sup>a</sup>35–36).

#### Note 902

**Democritus for his part seems to think that there were three differentiae:** See A 4 985<sup>b</sup>4–10.

#### Note 903

**Others due to the attributes [special] to perceptibles . . . and in general some due to excess, some to deficiency:** Perceptible substances, other than the elements, are produced by concoction (Z 16 1040<sup>b</sup>9n), so that they have different degrees of hardness and softness, density and rarity, dryness and wetness, depending on which active capacities (hot, cold) have mastered which passive ones (dry, wet), due to the excess of the one and the deficiency of the other, and to what extent.

#### Note 904

**And in some cases their being will even be defined by all of these, due to some parts being mixed, some blended, some bound, some solidified, and some making use of the other differentiae, as do hand and foot:** “Of the animals, some resemble each other in all their parts, whereas others have parts in which they are distinct. Some parts are the same in form [or species]—for example, one human’s nose and eye and another human’s nose and eye, one’s flesh and the other’s flesh, one’s bone and the other’s bone; and the same applies to the parts of a horse and of such other animals as we say are the same in form [or species]. For as the whole is to the whole, so each part is to each part. In other cases—those whose genus is the same—they are indeed the same [in form], but they differ in excess or deficiency. By genus I mean, for example, bird and fish, for each of these has differences with respect to its genus, that is, there are numerous species both of fish and of birds.

Now the differences of most of the parts in animals lie in the contrariety of their attributes (for example, of colors and shapes), in that some have the same things to a greater others to a lesser degree, and additionally in greater or fewer number, and larger or smaller size, and, in general, in excess or deficiency. Thus in some the texture of the flesh is soft, in others firm; some have a long bill, others a short one; some have many feathers, others few. Further, even in the cases we are considering, it happens that different ones have different parts—for example, some have spurs, others do not, some have crests and others do not. But (one might almost say) most of the parts, and those out of which the bulk of the body is composed, are either the same [in species or form] or differ by way of contrariety, that is, excess and deficiency—for greater or lesser [degree] may be taken to be a sort of excess and deficiency. Some animals, however, do have parts that are neither the same in species nor [different] in excess and deficiency, but are [merely] analogous—for example, as bone is to fish-spine, nail to hoof, hand to claw, feather to scale. For what feather is in a bird, scale is in a fish” (HA I 1 486<sup>a</sup>14–<sup>b</sup>22).

#### Note 905

**We must, then, get hold of the kinds of the differentiae—for these are going to be starting-points of the being** (to *einai*): The being (essence, form) for  $O_1$  is its ultimate differentia  $D_1$ , that for  $O_2$  is  $D_2$ , and so on (Z 12 1038<sup>a</sup>25–26). Suppose that for each  $D_x$  there is a kind  $K_x$  into which it falls, and suppose that if  $D_n$  and  $D_m$  both belong to the same kind  $K$ , there is some  $\phi$  such that each of them can in turn be defined as  $\phi K$ , where  $\phi$  is some feature or features (such as difference in excess and deficiency or in the straight and curved) that distinguish  $D_n$  from  $D_m$ . We can then use the  $K$ 's and their “differentiae,” the  $\phi$ 's, to reach starting-points that are more general, and so closer to the ultimate starting-points sought by the science of being qua being (E 1 1026<sup>a</sup>27n on universal mathematics). We will not end up with Democritus' three ultimate differentiae in this way, but we will not end up with the ones Aristotle goes through either. The point of going through them is to help us understand how in perceptible substances form can be actuality and matter potentiality (1043<sup>a</sup>4–28, @ 6 1048<sup>a</sup>36–<sup>b</sup>6), which Aristotle sees as his resolution to the otherwise insoluble puzzle of the unity of substance and of definition (H 6 1045<sup>a</sup>7–33). The point of the present remark about the need to look for the kinds of the differentiae is to remind us that we should not mistake the aid to understanding for the goal of the enterprise. At the end of the day, indeed, the ultimate  $K$ s should turn out to be the categories, so that the opening claim made in Z 1 that things are said to be in as many ways as there are categories will be vindicated.

#### Note 906

**If something is differentiated by shape, or by smoothness and roughness, all these are differentiated by [kinds of] straight and curved:** “Something is smooth because its parts lie somehow in a straight line, rough because some stick up above the others” (Cat. 8 10<sup>a</sup>22–24).

#### Note 907

**Being is being mixed:** Reading τὸ μὲμιχθαι with Ross and the mss. for OCT τὸ μὲμιχθαι.

Note 908

**If indeed its substance is the cause of each one's being:** See Z 17 1041<sup>a</sup>9–10n.

Note 909

[1] None of these differentiae is substance, [2] not even when it is coupled [with matter], nonetheless [3] in each case it is the analogous thing to it: Consider the case of the threshold. Since definition is “of the universal and of the form” (Z 11 1036<sup>a</sup>28–29), the definition given of the threshold (1043<sup>a</sup>7–8) must be of its form, T. But that definition is m (wood, stone) placed in way D—where D is the relevant differentia. This is because a threshold is a matter-form compound, so that in the definition of T—as in the definition of the snub—there must be a reference to matter (E 1 1025<sup>b</sup>28–1026<sup>a</sup>6, Z 5 1030<sup>b</sup>18, 11 1036<sup>b</sup>21–32, 17 1041<sup>b</sup>11–33). If we were defining the universal compound threshold, we would have to include a definition of the form of the wood or of the stone as well (Z 10 1035<sup>b</sup>34n). What [1] tells us is that D is not substance, even if we couple it with m. This is because what the substance is in this case is T, not D or even D-in-m. For form and essence are substance (7 1032<sup>b</sup>1–2). Yet [3] D is analogous to T, because as D is predicated of m, so in thresholds, since they are matter-form substances, T is predicated of the relevant particular matter m\*—this parcel of wood or stone. The reason for proceeding analogically is that it is easier to see how D is related to m than it is to see how T is related to m\*—and, we might add, easier to see *that* than to see how the form of the human is related to this parcel of living flesh, bones, and sinews.

Note 910

**In substances what is predicated of the matter is the activation (*energeia*) itself:** See Z 13 1038<sup>b</sup>6, H 2 1042<sup>b</sup>10n.

Note 911

**The activation (*energeia*) of one matter is different from that of another:** See H 2 1042<sup>a</sup>28n.

Note 912

**Those . . . who propose:** Reading προτιθέντες with Ross for OCT προσθέντες (“those who add”).

**Are speaking of the activation (*energeian*):** See H 2 1042<sup>a</sup>28n.

Note 913

[1–3]: See E 1 1026<sup>a</sup>6n.

Note 914

**The account that it is given in terms of the differentiae is of the form and the activation (*energeias*):** See Z 12 1038<sup>a</sup>18–26.

Note 915

**The sorts of definitions that Archytas used to accept:** Archytas, who flourished c. 400–350 BC, was a Pythagorean mathematician and philosopher from Tarentum. It was he who sent a ship to rescue Plato from Dionysius II of Sicily. The examples given to illustrate his views on definition (stillness, calm) are used to show the usefulness of similarity in developing definitions: “Getting a theoretical grasp on

what is similar in things that differ greatly is useful for definitions—for example, that a calm in the sea and a stillness in the air are the same (for each is a quietness)” (*Top.* I 18 108<sup>b</sup>23–26).

Note 916

**Whether a line is a two in length or a two:** See Z 11 1036<sup>b</sup>12–13.

**A soul is substance and activation of a certain sort of body:** See Z 10 1035<sup>b</sup>14–16.

Note 917

**Said in one account:** See Z 11 1037<sup>a</sup>18.

**“Animal” might in fact be applied to both . . . reference to one thing:** See I 2 1003<sup>a</sup>33–<sup>b</sup>10.

Note 918

**For a soul and being for a soul are the same:** Being for a soul = the essence of a soul (I 4 1006<sup>a</sup>33–34n) = the form of a soul = the activation of a certain sort of body (1043<sup>b</sup>1–2) = a soul (1043<sup>a</sup>35–36).

**Being for a human and a human are not the same, unless the soul too is also going to be said to be a human—in which case, in one way they are the same, in another way not:** See Z 11 1037<sup>a</sup>5–10.

Note 919

**If, then, this is cause of the being, and if this is substance, they will not be stating the substance itself:** Reading εἰ οὖν τοῦτ’ αἴτιον τοῦ εἶναι, καὶ οὐσία τοῦτο, αὐτὴν ἂν τὴν οὐσίαν οὐ λέγοιεν with Ross for OCT εἰ οὖν τοῦτ’ αἴτιον τοῦ εἶναι, καὶ οὐσία τοῦτο, αὐτὴν ἂν τὴν οὐσίαν λέγοιεν (“If, then, this is cause of the being, and this is substance, they will be stating the substance itself”). The second “this” refers back to “cause of the being” (Δ 8 1017<sup>b</sup>14–15).

Note 920

**This substance, then, must either be eternal:** See A 6 1071<sup>b</sup>5–22.

**Or it must be capable of passing away without being in the process of passing away:** See Z 15 1039<sup>b</sup>20–27.

Note 921

**It has been shown and made clear in another discussion (*en allois*) that no one makes or begets the form:** On the assumption that Z and H form a continuous discussion, the use of *en allois* to refer to Z 8 suggests that it may be a later addition to that discussion (Z 7 headnote).

Note 922

**Perhaps indeed neither these nor any of the other things that are not composed by nature are substances at all:** See H 2 1043<sup>a</sup>4–7: “none of these differentiae [of artifacts] is substance, not even when it is coupled [with matter], nonetheless in each case it is what analogous to it.”

Note 923

**One might take the nature to be the only substance found in things that can pass away:** See E 1 1026<sup>a</sup>6–23.

## Note 924

**So the puzzle that the followers of Antisthenes and similarly uneducated people used to puzzle over has a certain timeliness:** 1043<sup>b</sup>4–32 = SSR V A 150 (pp. 193–195). On Antisthenes and his puzzle, see Δ 29 1024<sup>b</sup>26–1025<sup>a</sup>1. On being uneducated, see α 3 995<sup>a</sup>12n. The “so” takes us back to the discussion of definition that precedes the long parenthetical digression, 1043<sup>b</sup>14–23.

**A definition is a “long story”** (*logon makron*): Or “long account,” but with the implication of never coming to the end it sets out to achieve. Compare N 3 1091<sup>a</sup>7–8. **Although it is actually possible to teach people what sort of thing it is:** Reading ἀλλὰ ποῖον μὲν τί ἐστὶν ἐνδέχεται καὶ διδάξαι with Ross for OCT ἀλλὰ ποῖον μὲν τί ἐστὶν ἐνδέχεται [καὶ] διδάξαι ὁρίσασθαι δ’ οὐ.

## Note 925

**For example, silver—what it is we cannot say, but that it is like tin, we can say:** Suppose that silver =<sub>def</sub> white, heavy, ductile, malleable, metal. In accord with his view that “nothing could be fairly put into words except by the account that properly belonged to it, one to one” (Δ 29 1024<sup>b</sup>32–33), Antisthenes will divide this up: Silver is white, silver is heavy, silver is ductile, and so on. The truth-maker for each of these, however, is a distinct being: the white silver, the heavy silver, the ductile silver. And each of these is fairly put into words only by an account proper to it, one to one. No matter how long the definiens is, then, it never succeeds in fairly putting into words a definiendum that is simple, since in effect it will always divide it up into distinct definienda.

## Note 926

**Of one sort of substance there can be a definition and an account, namely, of the compound sort, whether perceptible or intelligible, but of the primary parts of which this is composed, there cannot be any:** Notice that this is Antisthenes’ view not Aristotle’s.

**The other of shape** (*morphê*): The shape being, as often, the form.

## Note 927

**The substance is also one in this way . . . by being . . . an actuality and a sort of nature:** See 1043<sup>b</sup>21–22. Notice *hê kata to eidos phusis* (“the nature that is in accord with the form”) at Z 7 1032<sup>a</sup>22–25 and *hê kata to eidos ousia* (“the substance that is in accord with the form”) here (1044<sup>a</sup>10–11).

## Note 928

**More and less** (*to mallon kai to hêtton*): As a musician tightens or loosens his instrument’s strings until a certain target note is struck (*Pol.* IV 3 1290<sup>a</sup>22–29), so it is too with vocal cords, sinews, and other string-like things (*GA* V 7 787<sup>b</sup>10–24). Hence the notion of tightening and loosening gets employed wherever a certain tripartite structure is thought to exist, consisting of a continuous underlying subject, often referred to as *to mallon kai to hêtton*, a pair of opposed attributes that can vary in degree, and a target, typically a mean condition of some sort, that can be achieved by tightening or decreasing loosening the underlying subject to



change the degree of the attributes. As a result, Aristotle speaks of tightening and loosening in characterizing a wide range of phenomena, from the parts of animals to political constitutions (*Pol.* V 9 1309<sup>b</sup>18–31, *Rh.* I 4 1360<sup>a</sup>23–30). In the case of noses and other such parts, the continuous underlying subject is flesh and bone (or its shape), the pair of opposite attributes is hooked and snub, and the target—which lies somewhere in between the two, and so (as in political constitutions) in a mean of some sort—is being a straight nose, or at the very least a nose of some sort. In the case of colors, too, while many are constituted out of white and black in some definite ratio, others are constituted in “some incommensurable ratio of excess or deficiency,” and so are apt for tightening and loosening (*Sens.* 3 439<sup>b</sup>30). **The substance that is in accord with the form does not admit of more and less, but if indeed any does, it is the one with the matter:** The form of a matter-form compound—a human being, say—has a definition, just as health does. And what is defined by it—the form of a human being—is fixed and unchanging, and so does not admit of tightening or loosening or of more and less. As embodied in different particular humans, however, that form does admit of more and less, in part because of the mechanics of embryogenesis, where it can to different degrees be disabled or distorted by the female menses (*Z* 8 1034<sup>a</sup>5–8n, 9 1034<sup>a</sup>33–<sup>b</sup>7). The fact that matter-form compounds do admit of more and less is part of what explains why relations between their forms (the ontological correlates of natural scientific theorems) hold only for the most part (*E* 2 1027<sup>a</sup>13–15).

#### Note 929

**Phlegm comes from bile by the analysis of the bile into its primary matter** (*tên prôtên hulên*): On *prôtê hulê*, see *Z* 3 1029<sup>a</sup>20–21n.

#### Note 930

**Analyzed into its starting-point:** A starting-point is sometimes contrasted with an element (*Z* 17 1041<sup>b</sup>31–33), but not here (or at *A* 4 1070<sup>b</sup>16–26).

#### Note 931

**Of some things, because they are different, the matter is of necessity different—for example, a saw could not come to be of wood, nor can the moving cause bring this about:** “It is evident, then, that the necessity in natural things is what is called matter and the movements of the matter. And the natural scientist should state both causes, but most of all the for-the-sake-of-which. For this is the cause of the matter, not the matter of the end. And the end is the for-the-sake-of-which, and the starting-point is from the definition and the account, as in the things produced by craft. For example, since a house is such-and-such sort of thing, these things must of necessity come to be or be present, or since health is this, these things must come to be or be present of necessity—and similarly if a human is this, these must be, and if these, these others. Presumably, though, the necessity is also present in the account. For suppose the function of sawing is defined as such-and-such sort of division, well, it will not occur unless the saw has teeth of such-and-such a sort, and these cannot be of such-and-such a sort unless they are made of iron. For even in the account there are parts that stand as matter to the account” (*Ph.* II 9 200<sup>a</sup>30–<sup>b</sup>7; also *Z* 11 1037<sup>a</sup>16–17). If the account of an artifact A or

natural being N assigns it a function that can only be achieved by something made from matter of sort m, then matter of sort m is “hypothetically necessary (*anagkê ex hupotheseôs*)” for A or N to exist (*PA* I 1 639<sup>b</sup>21–640<sup>a</sup>10, 642<sup>a</sup>1–13, 642<sup>a</sup>31–<sup>b</sup>4).

Note 932

**Perhaps, though, the form, or essence, and the for-the-sake-of-which are the same:** “The what-it-is [= form, essence] of something and the for-the-sake-of-which are one, while what the motion first originates from is the same as them in form, since human begets human” (*Ph.* II 7 198<sup>a</sup>25–27).

Note 933

**If indeed the causes are these and this many:** See *A* 3 983<sup>a</sup>24–<sup>b</sup>6, 10 993<sup>a</sup>11–13.

Note 934

**Perhaps some have no matter, or not matter of this sort but only matter capable of movement with respect to place:** See *H* 1 1042<sup>b</sup>6n.

Note 935

**Nor is there matter for those things that are certainly by nature but are not substances, where instead the substance is the underlying subject:** See *Z* 13 1038<sup>b</sup>4–6.

Note 936

**As for the for-the-sake-of-which, perhaps there is not one:** Usually the final cause (the for-the-sake-of-which) and the formal cause are the same (1044<sup>b</sup>1), yet an eclipse has a formal cause (specified by its explanatory account), but seems not to have a final one. The sun’s movement has such a cause, as does that of the moon, but that the two together result in an eclipse seems to have no further final cause.

Note 937

**If we add “as a result of the earth coming in between,” then this is the account that involves the cause:** “Insofar as we grasp that something is, to that extent we also have some grasp on the what-it-is. As for grasping something of the what-it-is, let it in the first place be this way. A is eclipse, C is moon, B is screening by the earth. To inquire into whether the moon is eclipsed or not is to inquire into whether B is or not. This is no different from inquiring into whether there is an account of the eclipse. And if there is, we say that it is eclipsed. . . . When we discover it, we know the that and the why at the same time—if we proceed through middle terms (*dia mesôn*). Otherwise we know the that but not the why. C is moon, A is eclipse, B is not being able to produce a shadow during full moon although nothing is between us and it. If B (not being able to produce a shadow during full moon although nothing is between us and it) belongs to C, and A (being eclipsed) belongs to B, then that it is eclipsed is clear but not yet why it is. And we know that there is an eclipse but we do not know what it is. But when it is clear that A belongs to C, then to inquire into why it belongs to it is to inquire into what B is—whether screening, rotation of the moon, or extinction. And this is the account of one of the extreme terms—for example, in this case of A. For an eclipse is a screening by the earth” (*APo.* II 93<sup>a</sup>28–<sup>b</sup>7).

## Note 938

**To what affection of the primary thing is this due:** “Sleep is not every incapacity of the perceptual part, but rather this affection arises from the evaporation that attends eating food. For that which is vaporized must be driven on to a given point and then must turn back and change just like the tide in a narrow strait. And in every animal the hot is made by nature to move upward, but when it has reached the upper parts, it turns back, and moves downward in a mass. That is why sleepiness mostly occurs after eating food, since then a large watery and earthy mass is carried upward. When this comes to a stop, therefore, it weighs down and makes drowsy; but when it has actually sunk downward, and by its return has driven back the hot, then sleepiness comes on and the animal falls asleep” (*Somn.* 3 456<sup>b</sup>17–28).

## Note 939

**Some things are and are not without coming to be or passing away:** See Z 15 1039<sup>b</sup>23–26n.

**For example, points (if indeed they are):** Aristotle is not skeptical about the existence of points, considered as cuts, divisions, or limits of lines (A 9 992<sup>a</sup>20–24). But, unlike some Platonists and Pythagoreans (B 1 996<sup>a</sup>12–15, 5 1001<sup>b</sup>26–1002<sup>b</sup>11, Z 2 1028<sup>b</sup>16–27), he does not think they are substances (K 2 1060<sup>b</sup>12–19, N 3 1090<sup>b</sup>5–13). So “if indeed they are,” means something like “if indeed they have the sort of robust being that makes it problematic that they can exist without coming to be or passing away.”

**If everything what comes to be comes to be from something and comes to be something:** See Z 7 1032<sup>a</sup>13–14.

## Note 940

**Is water rather the matter of wine in virtue of its state and its form, and of the vinegar in virtue of the lack of its state and a passing away of it contrary to nature:** In virtue of its state and form, the wine is composed of water; in virtue of the wine’s going sour [= the unnatural lack of its state or form] the resulting vinegar is composed of water.

## Note 941

**It is evident, then, that if people proceed in this way—as they usually do—to define and (*kai*) speak (*legein*), it is not possible to give an answer and solve the puzzle:** Aristotle often refers to Platonists as *hoi legontes eidē*—those who speak of (*legein*) of Forms or Ideas (A 9 990<sup>b</sup>19, Z 11 1036<sup>b</sup>13–14, 16 1040<sup>b</sup>27–28, M 4 1079<sup>a</sup>15). If *legein* is being so used here, as seems likely, then the mistake made by the people (= Platonists) who proceed in this way may either be (1) to define the human correctly, but to speak about this in a mistaken way (namely, in terms of separate Forms or Ideas) or (2) to define the human incorrectly because of speaking in terms of Forms or Ideas. The choice between (1) and (2) hinges then on whether or not Aristotle himself thinks the definition in question is correct. The only definition in play, however, not already interpreted Platonically, is D, the one implied at 1045<sup>a</sup>15: the human = the animal + the two footed. But in the sort of definition that Aristotle thinks correct, while there is a part that is the matter and a part that is the form (1045<sup>a</sup>33–35), the

form must be the *ultimate* differentia (Z 12 1038<sup>a</sup>19–20), and the matter must be the *ultimate* matter (1045<sup>b</sup>18, Z 10 1035<sup>b</sup>30). But the human is clearly not the ultimate matter of the human being, which is instead this body in this state (Z 17 1041<sup>b</sup>7), nor is the two-footed its ultimate differentia (12 1038<sup>a</sup>17–18n). So we should not assume that Aristotle does accept D, and so should prefer (2) to (1).

Note 942

**Of the account (*tou logou*) always one part is the matter and the other the activation—for example, the circle is shape plus plane:** Often *logos* is used in place of its ontological correlate, form (Δ 6 1015<sup>b</sup>25n). But here it must refer to the matter-form compound, whose matter is plane and whose shape (form) is circularity.

Note 943

**Of things, on the other hand, each thing that has no matter, whether intelligible or perceptible, is straightaway just what is a one, just as it is also straightaway just what is a being—a this, a quality, a quantity:** A thing that has matter, whether perceptible or intelligible, is a this in this (Z 5 1030<sup>b</sup>18)—this form in this matter. It owes its being and its being one to its form, and so is not straightaway a being or a one, in that it needs something other than itself to make it these things. The form itself, by contrast, or the this (Δ 8 1017<sup>b</sup>25–26, @ 7 1049<sup>a</sup>35), does not need anything else to make it one or a being; it is these things intrinsically or in its own right. Similarly, while a quality or a quantity is also this form in this matter, quality and quantity themselves, as categories and primary things (Z 9 1034<sup>b</sup>7–9), have no matter, are each intrinsically one and one being.

Note 944

**Lycophron:** An orator and sophist of the school of Gorgias, known only from Aristotle, who also refers to him at SE 16 174<sup>b</sup>32, *Ph.* 185<sup>b</sup>28 (which mentions his views on one and many), *Pol.* III 9 1280<sup>b</sup>10, *Rh.* III 3 1405<sup>b</sup>35, 1406<sup>a</sup>7, 9 1410<sup>a</sup>17.

Note 945

**Something's being pale will be a combination of surface and paleness:** See Δ 4 1070<sup>b</sup>20–21.

Note 946

**As has been said, the ultimate matter and the shape are one and the same:** The reference is to 1045<sup>a</sup>23–33, which does not in fact express the claim in precisely these terms.

**The ultimate matter:** See Z 10 1035<sup>b</sup>30n.

## BOOK THETA (IX)

Note 947

**They will all include the account of the substance, as we said in the earlier discussions:** See Z 1 1028<sup>a</sup>10–20, 3 1029<sup>a</sup>12–16, 4 1030<sup>a</sup>28–<sup>b</sup>7.

## Note 948

**Something is said to be . . . with respect to potentiality (*dunamin*) and actuality (*entelecheias*):** When a *dunamis* is contrasted with *entelecheia*, it is translated as “potential” or “potentiality,” whereas in other contexts (including many in Θ whose focus is on actuality and potentiality) it is translated as “capacity” and cognates (B 6 1003<sup>a</sup>1n).

**And in accord with the function:** On function, see B 2 996<sup>b</sup>7n; on its relation to actuality, see Θ 8 1050<sup>a</sup>21–23.

## Note 949

**Potentiality (*dunamis*) and activity (*energeia*) extend more widely than those cases that are said to be such only with reference to movement:** On *energeia* and its relationship to *entelecheia*, see H 2 1042<sup>b</sup>10n.

## Note 950

**When we have spoken about it:** In Θ 1–5.

**The determinations we make concerning activity:** See Θ 6 1048<sup>a</sup>27–<sup>b</sup>6.

## Note 951

**In another discussion:** See Δ 12 and notes.

## Note 952

**As in geometry we say that things are powers (*dunata*) or non-powers because of being or not being in some way:** See Δ 12 1019<sup>b</sup>33–34.

## Note 953

**In a way the capacity to act and to be affected are one:** “The activation of the perceptible object and of the sense is one and the same, although the being for each is not the same. I mean, for example, activated sound and activated hearing. For it is possible to have hearing and not to be hearing, and what has a sound is not always sounding. But when what can hear is activated and when what can sound is sounding, then activated hearing and activated sound take place at the same time, and we might call one of these listening, the other sounding. If, then, the movement, that is, the acting and the being affected, is in what is affected, both the activated sound and the activated hearing must be in what is capable of hearing. For the activation of what can act and produce movement takes place in what is affected. . . . The same account applies also to the other perceptual capacities and perceptibles. . . . But in some cases they [the activation of the object and of the sense] have a name, while in others one or the other has no name. For the activation of sight is called seeing, but that of color has no name” (DA III 2 425<sup>b</sup>26–426<sup>a</sup>13). The same idea, presumably, is the basis for the present claim.

## Note 954

**The other in what is capable of building them:** See Z 7 1032<sup>a</sup>32–<sup>b</sup>14.

## Note 955

**That is why insofar as it is naturally unified (*sumpephuken*) nothing is affected as a result of itself, since it is one, and not other:** When a doctor treats himself,

he does so insofar as he is other. This involves his having in himself two distinct starting-points. One is the craft knowledge of medicine that he has in his understanding, which is the starting-point of his active capacity to produce curative movements in a diseased body (Z 7 1032<sup>a</sup>32–<sup>b</sup>14), and the other is the diseased condition in his body, which makes him a suitable case for medical treatment (Δ 4 1014<sup>b</sup>20n).

Note 956

**Some starting-points of these sorts:** Starting-points of the active and passive capacities (Θ 1 1046<sup>a</sup>10–11).

**Are present in inanimate things, others in animate ones, and in a soul, and in the part of the soul that has reason:** “Of the non-rational part [of the soul], one part seems to be shared [with other living things] and nutritive—I mean, the cause of nutrition and growth. . . . Another natural constituent of the soul, however, also seems to be non-rational, although it shares in reason in a way. . . . Apparently, then, the non-rational part is also twofold, since the nutritive part does not share in reason in any way but the appetitive part (indeed, the desiring part as a whole) does so in some way, because it is able to listen to reason and obey it. It has reason, then, in the way we are said to have the reason of our fathers and friends and not in the way we are said to have that of mathematics” (NE I 13 1102<sup>a</sup>32–<sup>b</sup>33).

Note 957

**All the crafts, that is (*kai*), all the productive sciences:** See A 1 981<sup>a</sup>3n.

**Are capacities:** Often productive sciences and capacities are lumped together as things that can be used to achieve opposite effects, as medicine can be used to cure but also to kill (NE V 1 1129<sup>a</sup>13–16). Sometimes, though, a body of knowledge (such as rhetoric or dialectic) is classified as a capacity rather than a science, because its subject matter lacks the requisite sort of unity: “Rhetoric is constituted from the science of the *Analytics* [= logic and scientific explanation] and from the part of politics dealing with character [= ethics], resembling dialectic on the one hand, sophistical arguments on the other. But to the extent that someone tries to set out dialectic and rhetoric not as capacities but as sciences, he unwittingly obscures their nature by the change, setting them down as sciences dealing with specific subject matters, rather than with arguments alone” (Rh. I 4 1359<sup>b</sup>9–16).

Note 958

**The craft of medicine is for both disease and health:** The medical knowledge that enables the doctor to cure enables him to kill. What determines which he will do is not his medical knowledge but the states of character and practical thought that determine whether he will use it to do good actions or bad ones. See Θ 5 1048a10–15, NE VI 2 1139<sup>a</sup>31–<sup>b</sup>5.

Note 959

**The same account makes clear both the positive thing (*to pragma*) and its lack:** *To pragma* is an object of scientific knowledge, which, since an account makes it clear, must be a universal (Z 10 1036<sup>b</sup>34–1036<sup>a</sup>1, 11 1036<sup>a</sup>28). See also Θ 3 1047<sup>a</sup>2n.

## Note 960

**In contradistinction to the ones capable without an account:** Retaining τοῖς ἀνευ λόγου δυνατοῖς with OCT. I take the dative to be one of manner or measure of difference, and so have amplified it as “in contradistinction to.” But it might also be understood as an instrumental dative, so that the entire sentence would mean: “That is why things that are capable in accord with an account—by means of the ones capable without an account—produce contraries.” This introduces an entirely new idea, however, for which no foundation has been laid. Moreover, a doctor can produce contraries, it seems, without using an instrument that cannot itself do so, as might happen in a case where he gives instructions to an assistant.

## Note 961

**The Megarians:** A school of philosophers founded in the late 5th cent BC by Euclides of Megara, a follower of Socrates, and present at his death (Plato, *Phd.* 59b–c). It was never a genuine institution nor were its members—also referred to as “Dialecticians” and “Eristics”—doctrinally unified. Their views on capacities are otherwise unattested. Their thought, though, seems to be that since capacities are in evidence only when active or actualized, we have no good grounds for attributing them to things when they are not active.

## Note 962

**It cannot be due to the passing away of the thing (*tou pragmatos*), since it always is:** As at © 2 1046<sup>b</sup>8 *to pragma* is the object of scientific knowledge, which, as a universal, cannot pass away (Z 15 1039<sup>b</sup>20–1040<sup>a</sup>7).

## Note 963

**The argument of Protagoras:** See I<sup>1</sup> 5 1009<sup>a</sup>6–16.

## Note 964

**It is evident that capacity and activity are distinct:** See H 2 1042<sup>b</sup>10n.

## Note 965

**And similarly for the other categories:** Categories other than substance or the what-it-is. See Z 1 1028<sup>a</sup>20–31, Δ 17 1017<sup>a</sup>22n.

## Note 966

**A given thing is capable if nothing impossible follows from the assumption that the activity it is said to have the capacity for belongs to it:** A is capable of engaging in the activity of  $\phi$ -ing means that if X follows from the fact that A is actually  $\phi$ -ing, then X is not impossible.

**There will be nothing impossible occurring (*outhen estai adunaton*):** Switching now to another sense of *adunaton* (Δ 12 1019<sup>b</sup>21–33). “It is possible,” at 1047<sup>a</sup>26, as at 1047<sup>a</sup>20, translates *endechetai*.

## Note 967

**The name “activity” . . . has been extended to other things from applying most of all to movements:** See © 1 1046<sup>a</sup>1–2.

Note 968

**Activity seems most of all to be movement:** A view that seems true but that Aristotle rejects or accepts only with appropriate modifications (A 7 1072<sup>a</sup>24–27, 1072<sup>b</sup>1–4).

Note 969

**If what is capable is what we said it is, or follows from it:** What we said it is at © 3 1047<sup>a</sup>24–26.

**Then it is evident that it cannot be true to say that [a] a given thing is capable of being but will not be, [b] so that (*hōste*) things incapable of being would thereby vanish:** At least two interpretations are possible. (1) Do not say [a] a given thing is capable of being but will not be, since it will follow that [b] things incapable of being will thereby vanish. (2) Do not say this: if [a] a given thing is capable of being but will not be, it follows that [b] things incapable of being will thereby vanish. The so-called Principle of Plenitude says either (3) All possibilities will at some time be actual, or (4) All eternal possibilities (all things that are at all times possible) will at some time be actual. (1) commits Aristotle not to (4), which he may accept, but to (3), which he seems to reject: “it is possible for this cloak to be cut up, but it will not be cut up but will wear out first” (*Int.* 19 19<sup>a</sup>12–14). In any case, (1) does not follow from what was said at © 3 1047<sup>a</sup>24–26, is clearly false, and is not responded to in the rest of the discussion. (2), by contrast, is responded to and rejected, and so it is best seen as a critic’s dialectical challenge to Aristotle’s definition at © 3 1047<sup>a</sup>24–26.

Note 970

**Someone who is not rationally calculating that the diagonal is incapable of being measured:** See A 2 983<sup>a</sup>19–21.

Note 971

**There will be nothing impossible (*adunaton*) occurring:** Switching again, and for the rest of the chapter, to the other sense of *adunaton* (A 12 1019<sup>b</sup>21–33, © 3 1047<sup>a</sup>25–26).

Note 972

**If when A is the case it is necessary that B is the case, then if A is possible, it is necessary that B is possible:** The modal claim here is: (1) If  $\Box(A \supset B)$  then  $\Box(\Diamond A \supset \Diamond B)$ . Later (1047<sup>b</sup>26–27) the converse is stated: (2) If  $\Box(\Diamond A \supset \Diamond B)$  then  $\Box(A \supset B)$ . (1) is clearly true. But (2) seems equally clearly false: (3) if  $\Box[\Diamond(\text{the deck is cut}) \supset \Diamond(\text{the card showing at the cut is red})]$  then  $\Box[(\text{the deck is cut}) \supset (\text{the card showing at the cut is red})]$ . When Aristotle explains what (1) and (2) mean, however, his explanation is more complicated than our formal representation of them reveals: (4) “to say that B is of necessity possible if A is possible signifies this, that if ever A were the case, both *when* and *in the way that* it was supposed to be possible for it to be, then it is necessary for B to be the case at that time and in that way too” (1047<sup>b</sup>27–30). Look again at (3). To determine whether “ $\Diamond(\text{the deck is cut})$ ” is true, we suppose that the deck is cut at time  $t_i$  in the way,  $W_i$ , that was supposed possible, and see if anything impossible follows. Suppose nothing does. Then by the definition



given at  $\Theta$  3 1047<sup>a</sup>25–26 it is possible for the deck to be cut in *W* at  $t_1$ . Now look at “ $\Diamond$ (the card showing at the cut is red)” and suppose it to be true at  $t_1$  in *W*. Now something impossible may follow. For if when the deck is cut at  $t_1$  the card showing is black, then it is not possible that the card showing in *W* at  $t_1$  is red. With (4) in the picture, then, it may be that (2) is true after all—or, at any rate, less obviously false.

#### Note 973

**In the case of some prior activation is necessary for their possession, namely, those that come by habit or (*kai*) by reason:** Treating *kai* as having disjunctive force. If it has conjunctive force, Aristotle omits those capacities acquired through habit by non-rational animals. See also *NE* II 4 1005<sup>a</sup>17–26, quoted in  $\Theta$  8 1050<sup>a</sup>1–2n.

#### Note 974

**Some things are capable of producing movement in accord with reason (*kata logon*) and their capacities involve reason (*meta logou*):** “Socrates was not speaking correctly when he said that virtue was reason because it was not beneficial to do courageous and just actions unless one did them knowingly and deliberately chose them by reason. That is why he incorrectly said that virtue is reason. Present thinkers, by contrast, do better, since it is doing noble things in accord with correct reason (*kata ton orthon logon*) that they say is virtue. Even they, however, are not correct. For one might do just actions with no deliberate choice whatsoever or with no knowledge of noble things but through some non-rational impulse, and yet do them correctly and in accord with correct reason (I mean where one does them as the correct reason *would* command). All the same, this sort of action is not praiseworthy. It is better, as we do, to define virtue as the impulse toward what is noble that involves reason (*meta logou*), since that is both a virtue and praiseworthy” (*MM* I 34 1198<sup>a</sup>10–22; also *NE* VI 13 1144<sup>b</sup>25–28).

#### Note 975

**I mean by this desire (*orexin*):** “The things that move an animal are thought, imagination, deliberate choice, wish, and appetite. And all these can be led back to understanding and desire. For both imagination and perception have the same place [in causing movement] as understanding” (*MA* 6 700<sup>b</sup>17–20); “It is always the object of desire that produces movement, and this is either the good or the apparent good” (*DA* III 10 433<sup>a</sup>27–29).

**Deliberate choice:** See  $\Delta$  1 1013<sup>a</sup>21n.

#### Note 976

**It has the capacity for that thing in that way when the thing affected is present and in the relevant condition:** Omitting  $\rho\omicron\tau\epsilon\iota\nu$  with OCT. If  $\rho\omicron\tau\epsilon\iota\nu$  is retained, the sentence reads, “it has the capacity to act [in that way] when the thing affected is present and in the relevant condition.”

#### Note 977

**It is not further necessary to add to the definition “provided nothing external prevents it”:** Nonetheless, Aristotle often does add such a clause: “If everything sweet should be tasted, and this (some particular thing) is sweet, it is necessary

for someone who is capable and is not prevented also at the same time to do this” (NE VII 3 1147<sup>a</sup>25–31); “Whenever someone understands that every man should take walks, and that he is a man, at once he takes a walk, or if he understands that no man should take a walk now, and that he is a man, he at once stays put. And he does each of these things provided nothing prevents him [from doing it] or compels him [to do something else]” (MA 7 701<sup>a</sup>7–16). In some cases, what does the prevention can be internal, as in cases of *akrasia*, or lack of self-control, where what prevents the agent acting on his deliberation may be a stronger contrary appetite. But it may also be external: “A person is capable of contemplating if he wishes, provided there is not something among the external things that prevents it” (DA II 5 417<sup>a</sup>27–28). What explains his proceeding differently here is presumably this. He is interested in the rational capacity C, and in what precisely is actualized when C is actualized. So he wants to define C in a sufficiently thorough way that when it meets up with the corresponding capacity to be affected it is necessarily actualized. For it is only then that what happens when they meet is the actualization of C and nothing else. When, on the other hand, the focus is on giving a scientific explanation of an agent’s deliberately chosen action, as in the texts just cited, we can frame the relevant universal scientific theorem only by using some equivalent of a *ceteris paribus* clause, whether it is “provided nothing prevents it” or by adding that the theorem holds only “for the most part” (E 2 1026<sup>b</sup>27–1027<sup>a</sup>15). And the reason for this is that different agents can possess the same capacity, just as they can be healthy or know a craft, in different ways and to different degrees (H 3 1044<sup>a</sup>10n). The carefully specified capacity we need to focus on to get a better grip on potentiality and actuality will thus be too fine-grained to use when giving an explanation that applies to all these agents.

#### Note 978

**What it is and what sort of thing:** See Δ 28 1024<sup>b</sup>5n.

#### Note 979

**We also use the term in a different way, which is why in the course of our inquiry we went through the former:** See Θ 1 1045<sup>b</sup>35–1046<sup>a</sup>4.

#### Note 980

**We say that even someone who is not contemplating (*theōrounta*) is a scientific knower if he is capable of contemplating:** On the various meanings of *theōrein*, see A 2 982<sup>b</sup>9n.

#### Note 981

**From many of the other beings:** Reading ἡ πολλοῖς τῶν ὄντων with Ross.

#### Note 982

**The latter things can sometimes also be truly said to be unconditionally:** And so, most pertinently, we can say of them that they are what they actively or actually are.

#### Note 983

**But in coming to be:** Reading γένεσσι with Makin for OCT ἀλλὰ γνώσει (“but rather in knowledge”). For the meaning, see α 2 994<sup>b</sup>27n.

## Note 984

**Of the actions (*praxeōn*) that have a limit none is an end, but all are in relation to an end—for example, making thin:** “A certain difference, however, appears to exist among ends. For some are activities while others are works (*erga*) of some sort beyond the activities themselves. But wherever there are ends beyond the actions, in those cases, the works are naturally better than the activities” (*NE* I 1 1094<sup>3</sup>–6). The shift from speaking of activities to speaking of actions, common to both this passage and our text, is justified by the fact that actions, or at any rate complete actions—actions that are ends rather than having ends that are beyond them—just are activities.

## Note 985

**Cases of movement in which the end of the movement does not yet belong are not cases of action, at least not of complete action, since none is an end. But the sort in which the end belongs really is an action:** “Every movement (for example, building) is in time and relates to some end and is complete when it has produced what it seeks to produce—in other words, in this whole time that it takes. And all movements are incomplete in their parts (and during the corresponding time), which differ in form both from the whole movement and from each other. For putting together the stones is different from fluting the column, and both of these are different from producing the temple. Also, the production of the temple is a complete production, since it lacks nothing as regards what was proposed. The production of the foundation and of the triglyph, though, are incomplete, since each is the production of a part. They differ in form, then, and it is not possible during any part of the time taken to find a movement that is complete in form, but if indeed such a movement is to be found, it is in the whole time taken. Similarly too in the case of walking and the rest. For if spatial movement is a movement from one place to another, there are differences in form here as well—flying, walking, leaping, and so on. And not only that but there are also differences in walking itself, since the from-where and to-where are not the same in a whole stadium racecourse as they are in a part of it or the same in one part as in another; nor is traversing this line the same as traversing that one, since we do not travel only along a line but also along one that is in a certain place, and this place is different from that. Well, we have discussed movement in an exact way in other places, and it does seem that it is not complete at every time but, rather, that its many sub-movements are incomplete and different in form, if indeed the from-where and to-where constitute their form” (*NE* X 4 1174<sup>21</sup>–<sup>25</sup>).

## Note 986

**Every movement is incomplete:** “Movement is the activity of what is incomplete, whereas what is activity in the unconditional sense is something else, namely, the activity of what is complete” (*DA* III 7 431<sup>6</sup>–7).

**Movement:** “The actuality of what is potential, when it is actively actual, not insofar as it is itself but insofar as it is movable, is movement” (*K* 9 1065<sup>21</sup>–23).

## Note 987

**As are one’s moving and having moved [something]:** Reading καὶ κινεῖ καὶ κέκινηκεν with Ross, which OCT brackets for deletion.

Note 988

**Is earth potentially a human? Or is that not so, but rather when it has already become seed, and perhaps not even then?:** See 1049<sup>a</sup>14–16.

Note 989

**The defining mark (*horos*) of what, as a result of thought, comes to be actual from what is potential is that, when it is wished for, it comes about if nothing external prevents it:** The products of crafts come about as a result of deliberation on the part of the craftsman, culminating in wish (*boulêsis*), which is a movement-causing desire: “whenever movement is produced in accord with calculation it is also in accord with wish” (DA III 10 433<sup>a</sup>23–25). If nothing prevents these movements from taking place, they transmit the requisite form from the understanding of the craftsman to the product (Z 7 1032<sup>a</sup>26–<sup>b</sup>14).

Note 990

**The seed is not yet potentially a human (for it needs to be placed in something else and to change); but when, because of a starting-point that belongs to itself, it is already in the latter state, it is already potentially human:** The “something else” referred to is not the uterus but the menses that will form the body of the emerging fetus (Z 9 1034<sup>a</sup>34n). This is “the other starting-point” (namely, the material one), referred to in the next sentence (1049<sup>a</sup>16–17). The starting-point that “belongs to itself” is the fetal heart (Z 10 1035<sup>b</sup>25–27n).

**For it needs to be placed in something else and to change:** Reading δεῖ γὰρ ἐν ἄλλῳ πεσεῖν καὶ μεταβάλλειν with Ross for ΟC1 δεῖ γὰρ ἐν ἄλλῳ καὶ μεταβάλλειν (“it needs to [come to be] in something else and to change”).

Note 991

**When we say that something is not this (*tode*) but rather *thaten* (*ekeinon*):** See Z 7 10 1033<sup>a</sup>7n.

Note 992

**If there is something primary that is no longer said to be *thaten* with reference to something else, then it is prime matter:** Suppose P (fire in the example) is prime matter, then there is no matter m such that P (now a this something or subject) is m-en (or composed of m). Thus P, if it is not a this something relative to some other matter m of which it is composed, is prime matter—on which, see Z 3 1029<sup>a</sup>20–21n.

Note 993

**Where what is predicated is a form and a this something:** See Δ 8 1017<sup>b</sup>25–26n.

Note 994

**Both matter and attributes are indefinite (*aorista*):** The matter under discussion is wood or perhaps (in the last analysis) fire, which has a definite character in just the way that the musical or the pale does (on which, see Γ 4 1007<sup>b</sup>4n). What is indefinite about them emerges when we see what they are, or what their essential definitions are. For these make clear the ontological dependence of matter

and attributes on substantial this somethings (Z 1 1028<sup>a</sup>20–<sup>b</sup>2, 3 1029<sup>a</sup>9–30, @ 8 1050<sup>a</sup>15–16).

Note 995

**It has been determined in how many ways things are said to be prior:** See Δ 11.

Note 996

**I mean by potentiality [or capacity] not only that defined sort that is said to be a starting-point of change in another thing or in another thing insofar as it is other:** “Defined” may have the sense of “defining,” or “definitional,” since all the other sorts of capacities or potentialities are said to be with reference to this one (Δ 12 1019<sup>b</sup>35–1020<sup>a</sup>4).

Note 997

**Activity is prior both in account:** Z 1 1028<sup>a</sup>34–36, 10 1034<sup>b</sup>30–32.

**And in substance, whereas in time it is prior in one way and in another not:** See Z 1 1028<sup>a</sup>31–33n.

Note 998

**The matter and the seed (*sperma*) and what is capable of seeing, which are potentially a human and corn and seeing:** The seed here is not male human seed (as at @ 7 1049<sup>a</sup>2), which is an exclusively formative agent (Z 9 1034<sup>a</sup>34n), but seed corn.

Note 999

**Everything that comes to be, comes to be something from something and as a result of something, and this is the same in form as it:** See Z 7–8.

Note 1000

**It is from this that the sophistical refutation arises, that someone who does not have scientific knowledge will be doing what the scientific knowledge is knowledge of:** “Someone might raise a puzzle, however, about how we can claim that people must do just actions to become just, and temperate ones to become temperate. For if people are doing what is just or temperate, they are already just and temperate, in the same way that if they are doing what is grammatical or musical, they already know grammar or music. Or doesn’t that hold in the case of the crafts either? For it is possible to produce something grammatical either by luck or on someone else’s instruction. Someone would be a grammarian, then, if he produced something grammatical and produced it in the way a grammarian would. And this is to do it in accord with the craft knowledge of grammar that is internal to himself” (NE I 1105<sup>a</sup>17–25).

Note 1001

**Something of what is coming to be must have come to be, and in general something of what is moving must have moved (this is made clear in the discussions concerning movement):** “Since everything that is changing is changing in time, and is said to be changing in time both as changing in its primary [or proper] time and as doing so with reference to another time (for example, we say that it changed in a certain year if it changed in some day of it), if the thing that is changing is

changing in the primary time, it must be changing in any given part of it. This is . . . evident from the following. Let PT be the primary time in which the thing that is moving is moving, and let PT be divided at S. For all time is divisible. In the time PS, then, either the thing is moving or it is not moving, and likewise in the time ST. Now if it is moving in neither of the two times, it will be at rest in the whole [= PT], since it cannot be moving in the whole if it is moving in none of its parts. If it is moving in only one of the two parts, PT cannot be the primary time in which it is moving, since its movement will be with reference to another time. So it must be moving in any given part of PT. With this shown, it is evident that everything that is moving must have been moving prior to that. For if what is moving has traversed the distance AB in the primary time PT, then in half that time a thing that is moving with equal speed will have traversed half of AB. But if the thing whose speed is equal has traversed a certain distance in a time, then in an equal time the first thing that is moving must have traversed the same. Hence what is moving [for example, in PT] must have been moving prior to that [for example, in the time taken to traverse half of AB]" (*Ph.* VI 6 236<sup>b</sup>19–237<sup>a</sup>2).

**The one who is learning too must presumably have something of the science:** See A 9 992<sup>b</sup>30–33n, Z 3 1029<sup>b</sup>3–12.

#### Note 1002

**They do not contemplate except in this way, or because they have no need to contemplate:** Reading οὐτοι δὲ οὐχὶ θεωροῦσιν ἀλλ' ἢ ὥδι, ἢ ὅτι οὐδὲν δέονται θεωρεῖν. The meaning of ἢ ὅτι οὐδὲν δέονται θεωρεῖν ("they have no need to contemplate"), which OCT brackets for deletion, has been found somewhat obscure and many emendations of the text have been proposed in an attempt to make it less so. On the face of it, however, we can surely recognize two classes of practitioners: (1) those who are practicing in order to *acquire* the capacity to contemplate and (2) those who are doing so in order to *retain* it. Those in (1) do not contemplate except this way, whereas those in (2) have another option, they have the capacity to contemplate but may not activate it (on a given occasion) because they have no need to do so (then).

#### Note 1003

**Even those in which the end is a movement:** The end of producing is something beyond the producing of it (for example, a house in the case of building), which—unlike the producing itself—is not a movement. Playing the flute, by contrast, which is or involves movement, may have playing the flute well or better as its end.

#### Note 1004

**If it does not happen in this way, it will be like Pauson's Hermes, since it will even be unclear whether the scientific knowledge is inside or outside, just as with that figure:** Aristotle mentions the painter Pauson—about whom little is otherwise known—as someone whose works the young should not look at, because they represent people as worse than they are (*Pol.* VIII 5 1340<sup>a</sup>36, *Po.* 2 1448<sup>a</sup>6). His Hermes was apparently a *trompe l'oeil* painting, which made it difficult to determine whether the figure of Hermes was inside (or behind) the plane of the canvas or outside (in front of) it, between the viewer and the canvas. The point of

the analogy is that unless we see a student activate his scientific knowledge in appropriate circumstances, it will be unclear whether he has it within himself or is merely repeating what he has heard from his teacher.

#### Note 1005

[1] The function (*ergon*) is the end (*telos*), and [2] the activity (*energeia*) is the function, and [3] this is why the name “activity” is said of things with reference to the function, and [4] extends to the actuality (*entelecheia*): [2] identifies the function of X not with a dormant capacity but with the activity that is the capacity activated or actualized in active functioning. Thus “the function of a human is activity of the soul in accord with reason or not without reason” (NE I 7 1098<sup>a</sup>7–8). Such active functioning, [1] tells us, repeating standard doctrine (B 2 996<sup>b</sup>7n), is X’s end. [1–2] explain [3]. For when we speak of X’s “activity,” we mean the one that is his function or end, the one in which X’s good consists: “When each thing completes in the best way that which—not coincidentally but intrinsically—is its function, the thing in question must be said to be good too, and the virtue by which each thing can by nature accomplish this should be deemed to have the most control. What is composite and divisible into parts has several different activities, but what is by nature simple and does not have its substance in relation to something else must have one controlling virtue intrinsically. If then a human being is a simple animal and his substance is ordered in accord both with reason and with understanding, he has no other function than this alone, namely, the attainment of the most rigorous truth about the beings. But if he is naturally co-composed of several capacities, and it is clear that he has by nature several functions to be completed, the best of them is always *his* function, as health is the function of the doctor, and safety of a ship’s captain” (*Protr.* B63–65). Picking up on Θ 3 1047<sup>a</sup>30–31, [4] tells us that the name “activity,” which applies most of all to movements, is extended from these to other things. Here the relevant other thing is the actuality, which is the activity looked at not as a sort of movement, as it were toward X’s end, but as the achievement or actualization of X’s end.

#### Note 1006

**Where what comes to be is some other thing beyond the use, in those cases the activity is in what is being produced:** “In the case of all capacities the activities are external, either in something other than the agent himself, or in himself insofar as he is other [as when a doctor makes himself healthy]” (*EE* VII 2 1237<sup>a</sup>36).

#### Note 1007

[3a–iii]: If activity is to be prior in form and in substance (1050<sup>a</sup>5) to potentiality, as [3a] is arguing, then form and substance must be activity (1050<sup>b</sup>2–3). Moreover, the form or substance of something must be in it rather than separate from it (A 991<sup>b</sup>1–2). But the form of an artifact, for example, is in the soul of a craftsman (Z 7 1032<sup>a</sup>32–<sup>b</sup>14), which may seem to be precisely the wrong location. It is there, however, not in activate fashion, but as a potential. When it is activated by the craftsman it gets transmitted, via his bodily movements, to the relevant matter, and so, as [3a–iii] argues, is located in that matter, which is just where it must be located to be the form or substance of the emerging artifact.

**In all the cases where there is not some other work (*ergon*) beyond the activity:**

“A certain difference, however, appears to exist among ends. For some are activities while others are works (*erga*) of some sort beyond the activities themselves” (NE I 1 1094<sup>a</sup>4–6). Thus the use of a certain capacity, which might be either (1) like the craft of building or (2) like sight, is an *ergon* (function) or activity. In the case of (1) this activity has an *ergon* (work, result) beyond it. In the case of (2), it does not.

**Which is why happiness is also in it, since it is a certain sort of living:** “A human’s function is . . . a sort of living, and this living is . . . activity of the soul and actions that involve reason, and it is characteristic of an excellent man to do these well and nobly, and each is completed well when it is in accord with the virtue that properly belongs to it—if all this is so, the human good [= happiness] turns out to be activity of the soul in accord with virtue and, if there are more virtues than one, then in accord with the best and most complete” (NE I 7 1098<sup>a</sup>12–18).

Note 1008

**So it is evident that the substance and the form are activity:** The sentence reports the conclusion of [3a–iii], with substance and form treated as equivalent (1050<sup>a</sup>5).

Note 1009

**In accord with this argument, then, it is evident that activity is prior in substance to potentiality:** The reference is to the argument of [3a] as a whole.

**As we have said, one activity always precedes another in time until we reach the activity of what primarily and eternally causes movement:** The reference is to 1049<sup>b</sup>24–29, which does not, however, trace the sequence of active movers back to the ultimate prime mover—on whom, see A 7–8.

Note 1010

**More controlling way:** See A 1 981<sup>b</sup>11n.

Note 1011

**Eternal things are prior in substance to things that pass away:** A is prior in substance or in nature to B if A can be without B but not B without A (Δ 11 1019<sup>a</sup>1–4, M 2 1077<sup>b</sup>2–3).

Note 1012

**Every capacity [or potentiality] is at the same time for something and for the contradictory:** See 1050<sup>b</sup>30–34.

Note 1013

**What admits of not being can pass away, either unconditionally or in that way in which it is said to admit of not being, namely, with respect to place, or to quantity, or to quality—“unconditionally” is “with respect to substance”:** When Socrates passes away with respect to a place, quantity, quality (or any of the other categories, substance excepted) he continues to exist (to be what he is) but ceases to be placed, qualified, or quantified in the way he used to be. When he passes away with respect to substance, on the other hand, when he ceases to be what he is (a human, say), he simply ceases to exist (Γ 2 1003<sup>b</sup>26–29).



## Note 1014

**These are primary things, since if they were not, nothing would be:** The primacy here is substantial primacy—or primacy “with respect to being without each other” (Z 10 1034<sup>b</sup>31–32). The necessary beings can be without the non-necessary ones, but not vice versa.

**Primary things:** See A 2 982<sup>a</sup>25–<sup>b</sup>7, Z 4 1030<sup>a</sup>10–11n.

## Note 1015

**Nothing prevents matter for this sort of movement from belonging to it:** See H 1 1042<sup>b</sup>6n.

## Note 1016

**That is why the sun, the stars, and the whole heaven are always active:** For the various meanings of “the heaven,” see A 5 986<sup>a</sup>2–3n. The relevant sense here is [2] “the body that is continuous with last circumference of the universe, in which we find the moon, the sun, and some of the stars” (*Cael.* 19 278<sup>b</sup>16–18).

**There is no fear that they may sometime stand still, which is what those concerned with nature fear, nor do they get tired doing this:** “The ancients assigned the heaven—that is, the upper region—to the gods, on the supposition that it alone is immortal. And the present account does testify that it cannot pass away or come to be, and, further, that it is unaffected by any mortal troubles, and that, in addition, it is effortless, because it needs no forceful necessity to constrain it and prevent it from traveling in another way that is natural to it. For everything of that sort involves effort—the more so, the more long-lasting it is—and is without a share in the best disposition. That is also why we should not suppose it to be in accord with the myth of the ancients, who say that it requires Atlas for its preservation. For in fact those who put together this account seem to make the same supposition as later thinkers, namely, that all the upper bodies have weight and are earthy, and so conceived for it, in mythical fashion, an animate necessity [to preserve it]. We should neither suppose it to be that way, then, nor that, because of its whirling, it has a movement that is faster than the downward one to which its own weight inclines it, and so is preserved for all this time, as Empedocles claims” (*Cael.* II 1 284<sup>a</sup>11–26). Hence the ancient fear is grounded, evidently, in the supposedly vast effort needed to keep the heaven moving.

## Note 1017

**The things that cannot pass away are also imitated by things that are involved in change—for example, earth and fire:** “Circular movement . . . is alone continuous. That is also why the other things that change into each other in accord with their attributes and capacities, as do the simple bodies, are imitating circular movement. For when air comes to be from water and fire from air and water back again from the fire, we say that coming to be has come around full circle, because it has turned around and come back again” (GC II 10 337<sup>a</sup>1–6). A reason for selecting fire and earth as examples is given at A 8 988<sup>b</sup>28–989<sup>a</sup>19.

## Note 1018

**These [fire, earth] too are always active, since they have their movement both intrinsically and within themselves:** The ultimate differentiae of the elements

(or simple bodies), earth, water, air, and fire are pairs of capacities, one member of which is productive (hot, cold), the other passive (dry, wet). Thus earth is cold and dry; water cold and wet; air hot and wet; fire hot and dry (GC II 3 330<sup>a</sup>30–<sup>b</sup>7). It is these capacities that determine the cycle of transformations referred to in the previous sentence (Z 3 1029<sup>a</sup>20–21n(2)). So the “movement” intrinsic and eternal to the element is apparently the active “struggle” between an element’s productive capacity and its passive one, as the one concocts the other (Z 16 1040<sup>b</sup>9n). The elements also have other movements that are intrinsic to them. Thus earth has an intrinsic tendency to move downward to its proper or natural place at the center of the universe, while fire has a natural tendency to move to its proper place at the periphery (*Cael.* IV 4). But these movements seem unrelated the cyclical transformation under discussion, and could hardly be characterized as being “within” the elements, as opposed to intrinsic or definitional of them.

#### Note 1019

Θ 9: (1) In A 2, Aristotle argues in a preliminary way that theoretical wisdom must, as the most estimable science, deal with the most estimable beings, and so be a sort of theology (982<sup>a</sup>24–983<sup>a</sup>11). In E 1, he argues that theology, though dealing with a single genus, could nonetheless be the right sort of universal science to be theoretical wisdom (1026<sup>a</sup>23–32). (2) In Z 1, he argues that the focus of this science must be substance, since it is in every way primary, namely, in account, in knowledge, and in time (1028<sup>a</sup>31–<sup>b</sup>7). Form then emerges as apparently the best candidate to be substance (Z 3 1029<sup>a</sup>26–33), but matter (or material substance) remains on the scene (Z 10 1035<sup>a</sup>2, H 1 1042<sup>a</sup>32). Then form gets identified with activity or actuality, matter with potentiality (H 2 1043<sup>a</sup>4–26). (3) In Θ 8, activation or actuality is argued to be prior to matter (or material substance) in account, in time, and in substance, and to be the end for the sake of which a capacity is acquired or possessed (1050<sup>a</sup>8–10). (4) Θ 9, which can seem an oddly placed collection of unrelated topics, becomes easier to understand if we see the first part (1051<sup>a</sup>4–21) in relation to (1), arguing that activity or actuality (form) is more estimable than potentiality (matter), and so is a better candidate to be the focus of the science of being qua being, and the second part (1051<sup>a</sup>21–33) in relation to (2), arguing that actuality is also prior in knowledge to potentiality, and so is in that respect too a better candidate to be primary substance. It then emerges as completing the project of (3) in an intelligible way.

#### Note 1020

**The activity is also better and more estimable than the excellent capacity:** See A 2 983<sup>a</sup>4–5n.

#### Note 1021

**In the case of those things that are said to be with reference to being capable, the same one is capable of opposites—for example, the same thing that is said to be capable of being healthy is also capable of being sick, and at the same time:** The activation of an excellent capacity  $C_e$ , such as health, must itself be excellent: “from health we do not do contrary actions but, rather, healthy ones only” (NE I 1

1129<sup>a</sup>15–16). Nonetheless, a healthy person, like a just one, is capable of doing—able to do—unhealthy or unjust things: “to do unjust actions is no less characteristic of a just person than of an unjust one, because the just person is no less—but even more—capable (*dunait'*) of doing each of these actions” (V 9 1137<sup>a</sup>18–20). A healthy or just person *will not* do unhealthy or unjust thing, then, but he *could* do them. That is the point of the phrase, “things that are said to be with reference to being capable.” Consequently, health is not a capacity for contraries in the sense that it can be activated in a good way (or as a good activity) and activated in a bad way (bad activity)—that is a feature special to capacities, such as the craft of medicine, that involve reason (Θ 2 1046<sup>b</sup>4–7). Rather, it is a capacity for contraries in this way: the same capacity  $C_e$  that makes X capable of A makes him capable of the contrary of A.

#### Note 1022

**For the contraries to be present at the same time, however, is impossible (for example, to be healthy and to be sick), so that it is necessary for the good (*tag-athon*) to be one or the other of them. But being capable is of both alike, or of neither. So the activity is better:** X has an excellent capacity  $C_e$  (health) that makes him (1) capable of healthy activities and (2) capable of the contrary, namely, unhealthy activities. When  $C_e$  is activated, however, it must, as an excellent capacity, result in an excellent activity. So  $C_e$  activated is better than  $C_e$ .

#### Note 1023

**And it is necessary in the case of the bad ones (*tôn kakôn*), too, for the end and the activity to be worse than the capacity. For the same thing is capable of both contraries:** “The bad ones” are bad capacities, which, like excellent ones, make their possessor capable of A and capable of the contrary of A. But just as the activation of an excellent capacity is always excellent, so the activation of a bad capacity is always bad. So the activation is worse than the capacity.

#### Note 1024

**It is clear, therefore, that the bad is not something beyond the things (*ta pragmata*):** Just as “the good” picks out the better of two things (an excellent capacity and the activation of it), so “the bad” picks out the worse of two (a bad capacity and the activation of it). The bad does not lie in the bad capacity, then, but in the things that result when it is activated, and so is not something beyond these things. It follows that there is no eternal starting-point of the bad as there is for the good (A 10 1075<sup>b</sup>6–7).

**For the bad is posterior in nature to the capacity:** A is prior in nature to B, if A can be without B but not B without A (Δ 11 1019<sup>a</sup>3–4). The bad, as the activation of a bad capacity, cannot be without that capacity, but the bad capacity can be without being activated (Θ 8 1049<sup>a</sup>24–25). So the capacity is prior in nature to its activation, the activation posterior in nature to the capacity.

#### Note 1025

**Neither, therefore, in the things that there are from the start nor in the eternal things is there anything bad or in error or corrupted (for corruption is also something bad):** Θ 8 argues that activity is prior to potentiality in account,

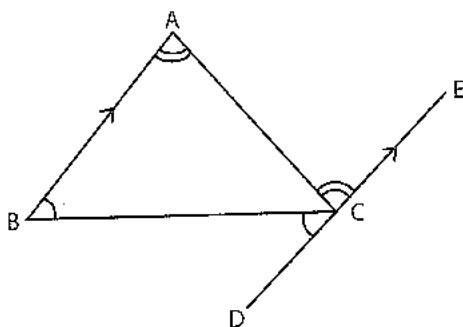
time, and substance (or nature)—meaning not that every potentiality or capacity is posterior in these ways to the activation or activity of it, but rather that some activities are prior to any potentialities. In particular, then, the things that are there from the start (the sublunary elements) and the eternal things (the heaven and its contents and the prime mover), which are all activities, are prior to the bad capacities, and so to the bad itself, which, as the activation of those capacities, is posterior to them. Notice that a parallel argument does not work so readily in the case of the good. For if some activities must be prior to any capacities, then it is arguably the good ones, not the bad ones, that can play this role. For one member of a pair of contraries is always the lack of the other (I 6 1011<sup>b</sup>18–19n). “It is possible to err in many ways,” however, “(for the bad belongs to what is without a limit, as the Pythagoreans portrayed it, and the good to what is definite), whereas there is only one way to be correct” (NE II 6 1106<sup>b</sup>28–31). It seems, then, that the bad must be defined as the lack of the good not the other way around. As a result, the good is prior in definition to the bad, giving it the ontological edge it needs.

#### Note 1026

**Geometrical diagrams (*diagrammata*) are discovered actively:** See B 3 998<sup>25</sup>n.

#### Note 1027

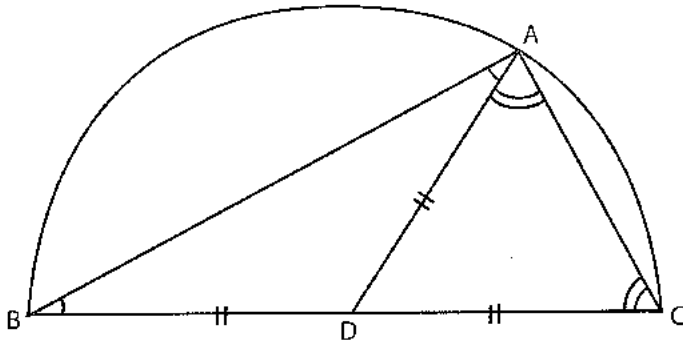
**Because the angles around one point equal two right angles. If, then, the line had already been drawn upward parallel to the side, why this is so would be immediately clear on seeing it:**



The diagrammatic proof Aristotle refers, which mentions drawing only one line—unlike the proof of Euclid I 32, which involves drawing two—seems to be this. The triangle whose interior angles we must show equal to two right angles is ABC. The division (1051<sup>22</sup>) actively made is to draw DC upward through C parallel to AB. Angle ABC = BCD (alternate angles). Angle BAC = ACE (alternate angles). Therefore, the angles BCD + ACB + ACE = ABC + ACB + BAC. But the angles BCD + ACB + ACE = the angles around the point C = two right angles. Therefore, ABC + ACB + BAC = the interior angles of the triangle ABC = two right angles. It is not implausible to claim that as soon as DE is actually drawn, we can see immediately that this is so.

## Note 1028

**Why is the angle in a semicircle universally a right angle?** Because if three lines are equal, namely, the two that form the base and the one dropped straight from the center, then it is clear on seeing it to the person who knows that (*ekeino*):



If, as seems likely, the reference of the demonstrative pronoun *ekeinos* is the previous geometrical truth that the interior angles of a triangle equal two right angles, then the diagrammatic proof Aristotle refers to may be this. The division actively made is to draw (or drop) DA from the center D to the circumference.  $BD = AD = CD$  (radii of the same semicircle). Therefore, BAD and CAD are isosceles triangles. Therefore, the angle  $BAD = ABD$  and the angle  $CAD = ACD$  (base angles of isosceles triangles are equal). Therefore, the angle BAC (which  $= BAD + CAD$ )  $= ABD + ACD$ . But  $ABC + ACB + ACE =$  two right angles (previous result). Therefore, the angle BAD must be a right angle.

## Note 1029

**The things that are potential are discovered when they are actively drawn** (*agomena*): *Agomena* is a participle of the verb *agein*, which means, among other things, “lead,” “carry,” “fetch,” “bring.” Here, however, as at *Top. I 2 101<sup>a</sup>16*, it means “draw” in the sense of “draw a line”: “he produces his paralogism . . . by drawing certain lines in a way in which they should not be drawn (*grammas tinas agein mê hōs an achtheîsan*).”

## Note 1030

**The cause of this is that understanding is the activity:** We are to imagine a geometer looking for a proof. He has the potential to discover one, since he is a geometer. But he will not actively understand (for example, why the three angles of a triangle  $=$  two right angles) until he discovers the proof, which he does in actively drawing the relevant lines.

**So that what is potential [is discovered] from the activity** (*ex energeias hê dunamis*): The sentence lacks a verb. “Discovered” is supplied from 1051<sup>b</sup>3. Thus “what is potential” has the same referent as “the things that are potential” at 1051<sup>a</sup>29, namely, the lines in the diagrams that are merely potential until they get actively drawn in the construction that effects the proof.

**And because of this they know by [actively] producing, since the single activity** (*hê energeias hê kat' arithmon*) **is posterior in coming to be:** The geometer has the potential to discover geometrical proofs by drawing constructions that exhibit them. That general capacity is posterior to activity, since he has to acquire it by actively drawing such constructions under the guidance of someone who already knows how to do so (© 8 1049<sup>b</sup>17–1050<sup>a</sup>3, 17–19). The “single activity” (literally, “the activity with respect to or in accord with number”) is the active construction of a new (or new to the particular geometer) proof-effecting diagram, which, as an exercise of, is posterior to, his general capacity to discover such constructions: “Potential scientific knowledge is prior in time in the individual, but in general it is not even prior in time. For all things that come to be do so from what is actual” (DA III 7 431<sup>a</sup>1–4).

#### Note 1031

© 10: (1) E 4 excludes from the purview of theoretical wisdom the sort of being that is being true or being false, considered as attributes of beliefs or propositions. At the same time, it adverts to a kind of truth and falsity that is in things rather than in beliefs or propositions (1027<sup>b</sup>25–26). In the case of “simple things and the what-it-ises,” it tells us that truth and falsity are “not even in thought,” and so not in things either (1027<sup>b</sup>37–38). (2) Z 17 renews the search for substance as the key to being qua being, by focusing on the fact that “the substance is some sort of starting-point and cause” (1041<sup>a</sup>9–10). As such, it must be the answer to the question “why does one thing belong to another?” (1041<sup>a</sup>10–11), so that “what is being looked for is the cause (and this is the form) in virtue of which the matter is something—and this is the substance” (1041<sup>b</sup>7–9). Exempted from such inquiry and teaching, however, are “things [said] simply” (1041<sup>b</sup>9–11), where “one thing is not said of another” (1041<sup>a</sup>34–<sup>b</sup>2).

#### Note 1032

**Since something is said to be or not to be [1] in some cases with reference to the figures of predication:** See Δ 7 1017<sup>a</sup>23n.

[3] **in others by being in the fullest way true or false** (*to de kuriôtata on alêthes ê pseudos*): At E 4 1027<sup>b</sup>31 being true, as an attribute of beliefs or propositions, is distinguished from “being in the full way (*kuriôs*).” A conflict results if what is being discussed here is “being in the fullest way.” But though the adverb *kuriôtata* does modify *on* (“being”), *on* must be taken with the phrase *alêthes ê pseudos* (“true or false”), so that the whole clause [3] describes the third way in which something is said to be or not to be, namely, “by being in the fullest way true or false.”

**Since this [being in the fullest way true or false], in the case of the things, is being combined or being divided:** Reading τὸ συγκεῖσθαι ἢ διηρῆσθαι for OCT τῷ συγκεῖσθαι ἢ διηρῆσθαι.

**In the case of the things:** See Δ 29 1024<sup>b</sup>18–19.

**What we call true:** Reading τὸ ἀληθὲς λεγόμενον for OCT τὸ ὡς ἀληθὲς λεγόμενον (“what we call truth”).

## Note 1033

**Where the things that admit of both contraries are concerned, then, the same belief or the same account comes to be false and true:** See Z 15 1039<sup>b</sup>27–1040<sup>a</sup>4.

## Note 1034

Instead, truth or falsity [for incomposite things] consists in this—to touch and to announce is true (for affirmation and annunciation are not the same): An affirmation (*kataphasis*) is something said of or predicated of something, whereas an annunciation (*phasis*) is not: “A *logos* is a significant voiced sound some part of which is significant when separated—as an annunciation (*phasis*), not as an affirmation (*kataphasis*). I mean, for example, that human signifies something, but not that the thing is or is not (though it will be an affirmation or denial if something is added); the single syllables of human, by contrast, signify nothing” (Int. 4 16<sup>b</sup>26–31). But sometimes, as in the following text, which is especially pertinent to ours, Aristotle fails to keep the distinction in mind: “An affirmation (*phasis*) is something [predicated] of something (*ti kata tinos*), as too is a denial, and each one is either true or false. By contrast, not all understanding is such, but that of the what-it-is in the sense of the essence is true, and is not something [predicated] of something. However, just as the seeing of a special object is true, but seeing that the pale is a human or not is not always true, so also with what is without matter” (DA III 6 430<sup>b</sup>26–30). When we actively understand an essence, then, we do not do so by predicating something of something. And the reason we do not is that an essence of the relevant sort is a form, not a form said or predicated of matter (H 3 1043<sup>b</sup>29–32). What happens instead is that the presence of the essence to the understanding is announced, as that of a guest might be, in a way that is analogous to touching something. For it is the essence itself and not a representation of it that the understanding grasps: “In the case of those things that have no matter, what understands and what is understood are the same, since theoretical scientific knowledge and what is known in that way are the same” (DA III 4 430<sup>a</sup>3–5). That is what makes touching the appropriate analogue. For while we might think that we see not, for example, people, but their colors and shapes, we do not think parallel thoughts about touching.

**To be ignorant is not to touch, since it is not possible to be mistaken about the what-it-is, except coincidentally:** “Falsehood always involves combination, since even if [it understands] the white thing not to be white, it combines not-white [with it]” (DA III 6 430<sup>b</sup>1–3). So, since understanding an essence involves no combination of one thing with another it cannot be false, and so we cannot be in error about it, except by combining some coincident with it.

## Note 1035

**The same holds, too, with regard to incomposite substances, for it is not possible to be in error about them:** Forms or essences, which have been the focus of discussion up to this point, are the substance of matter-form compounds, but are not themselves substances (A 3 983<sup>a</sup>27n). Rather it is the compounds themselves that are (composite) substances. However, some substances—the primary ones—

are identical to their forms or essences (Z 11 1037<sup>a</sup>33–b7), and so are themselves simple or incomposite (A 7 1072<sup>a</sup>31–32, 9 1075<sup>a</sup>5–10, *Protr.* B64).

#### Note 1036

**Being does not itself come to be or pass away, since if it did, it would have to come to be from something:** See Z 7 1032<sup>a</sup>13–14.

#### Note 1037

**With regard to those things that are just what something is** (*hoper einai ti*) and **activities:** Reading ὅσα δὴ ἐστὶν ὅπερ εἶναι τι καὶ ἐνέργειαι for OCT ὅσα δὴ ἐστὶν ὅπερ εἶναι τι καὶ ἐνέργειαι (“with regard to those things that are just what something is and active”). The things that are “just what something is” (Γ 2 1003<sup>b</sup>33n) are essences or forms (Z 1 1028<sup>a</sup>14–15, 4 1030<sup>a</sup>2), which are activities or actualities (H 2 1043<sup>a</sup>4–26).

**But where they are concerned, their what-it-is is inquired into, whether they are such-and-such or not:** See Z 17 1041<sup>a</sup>10–b11.

#### Note 1038

**But ignorance does exist, though it is not like blindness, since blindness would be like wholly lacking the part that understands:** Understanding is “the visual perception of intelligible things” (*Protr.* B24), but differs from sight in that, while a person can have eyes that are not actively seeing, he cannot have an understanding that is not actively understanding. For understanding is “in substance [or essence] an activity,” and so “it is not the case that it is sometimes [actively] understanding and at other times not” (DA III 5 430<sup>a</sup>18–22). See also A 10 1075<sup>b</sup>20–22.

#### Note 1039

**About the immovable things there can be no mistake as regards time, if we take them to be immovable:** “The understanding of indivisible things is found in those cases concerning which there is no falsehood, whereas in those in which there is both falsehood and truth, there is already some sort of combination of intelligible objects as into one—as Empedocles said ‘where many heads sprouted without necks’ and were then combined by love—so too these things that were separate are combined (for example, the incommensurable and the diagonal), and if it is of things that have been or that will be, it understands and combines time in addition” (DA III 6 430<sup>a</sup>26–b1).

### BOOK IOTA (X)

#### Note 1040

**Iota:** In the science of being qua being, substance is primary both ontologically and epistemologically. With substance now fully explored and explained, Aristotle turns somewhat abruptly to notions that are (mistakenly in his view) assigned a comparably basic role in the sciences of his predecessors, namely, the one (and so the many) and the various sorts of contraries, and to the puzzles to which these give rise. Iota 8–10 then uses the findings of the investigation to establish the important claim that things capable and things incapable of passing away must be in



different genera (see B 1 996<sup>a</sup>2–4, 4 1000<sup>a</sup>5–1001<sup>a</sup>3 (= [P10])) and to raise a fundamental problem for Platonic Forms.

#### Note 1041

It was stated previously: See  $\Delta$  6.

#### Note 1042

If something has by nature a starting-point of movement that is the very first of the first sort (I mean circular spatial movement as the first sort of spatial movement): Spatial movement, or movement with respect to place, like the matter required for it, is prior to other sorts of movement or changes, because something can have it without having them (H 1 1042<sup>b</sup>5–6n). Circular movement is prior to other sorts of spatial movement, because “it is simpler and more complete” than they are (*Ph.* VIII 9 265<sup>a</sup>16–17). For all spatial movements can, Aristotle thinks, be analyzed in terms of circular movement and rectilinear movement. A rectilinear movement, however, is incomplete if it never ends. And if it avoids ending by turning back (as it must in a finite universe), it is a compound of linear and circular movements. See also  $\Delta$  6 1016<sup>b</sup>16–17.

#### Note 1043

**Things . . . whose account is one . . . are things of which the understanding is one, and things of this sort are things of which it is indivisible, and it is indivisible when the thing is indivisible in form or in number:** “What is indivisible not with respect to quantity, but in form, is understood in an indivisible time and with an indivisible part of the soul” (*DA* III 6 430<sup>b</sup>14–15; also *Sens.* 7 448<sup>a</sup>19–20).

#### Note 1044

**The primary thing that is one would be the cause of substances’ being one:** Namely, their form or essence.

#### Note 1045

**The being for a one will sometimes be [1] the being for one of these things and sometimes [2] for something else that is even closer to the name, while the former things are closer to its capacity (*dunamei*):** The capacity (*dunamis*) referred to is that of the name to apply to various things. So anything that is one something-or-other is *a* one—a thing to which the name “one” can be applied, or that is part of the extension of “one.” When we ask what is the being for (or essence of) some things (F’s, G’s) in that extension, we could be asking [1] what is the being for one F or one G (= what is it to be one F or one G), or we could be asking [2] what is the being for one, whether one F or one G or one whatever. The focus of [1] is on F’s and G’s and what makes something one F or one G. The focus of [2] is on being one, and so is even closer to the name “one” or to what it means.

#### Note 1046

**Or perhaps what is intrinsically an element is the unlimited or something else of that sort:** That is, something from which fire and the like are composed, as Anaximander of Miletus (mentioned at A 1 1069<sup>b</sup>22) held. See DK B1 = TEGP 1.

Note 1047

**Weight and speed are common to both contraries:** The contraries are heavy and light, fast and slow. What is heavy and what is light both have some weight; what is fast and what is slow, some speed.

Note 1048

**They posit the movement of the heaven to be uniform and fastest:** Here "the heaven" refers to "[2] the body that is continuous with the last circumference of the universe, in which we find the moon, the sun, and some of the stars." See A 5 986<sup>2</sup>n.

Note 1049

**The quarter-tones (*diaeseis*) are two (not to hearing but in the ratios involved):** "[Socrates] We should use the ornaments in the heavens as models to help us study these other things [= the mathematical numbers]. It is just as if someone chanced to find diagrams by Daedalus or some other craftsman or painter, which were very carefully drawn and worked out. I mean, anyone experienced in geometry who saw such things would consider them to be very beautifully executed, I suppose. But he would think it ridiculous to examine them seriously in order to find there the truth about equals, doubles, or any other ratio. [Glaucon] How could it be anything but ridiculous? [S.] Don't you think, then, that a real astronomer will feel the same way when he looks at the motions of the stars? He will believe that the craftsman of the heavens arranged them and all that is in them in the most beautiful way possible for such things. But as for the ratio of night to day, of these to a month, of a month to a year, or of the motions of the stars to them or to each other, don't you think he will consider it strange to believe that they are always the same and never deviate in the least, since they are connected to body and are visible things, or to seek by every means possible to grasp the truth about them? . . . Don't you know that people do something similar with harmony too? They measure audible concordances and sounds against one another, and so labor in vain, just like astronomers. [G.] Yes, by the gods, and pretty ridiculous they are too. They talk about something they call a 'dense interval' [= quarter-tone]—putting their ears to their instruments, like someone trying to overhear what the neighbors are saying. And some say they hear a tone in between, and that it is the shortest interval by which they must measure, while others argue that this tone sounds the same as a quarter-tone. Both groups put ears before the understanding (*nou*). [S.] You mean those excellent fellows who vex their strings, torturing them, and stretching them on pegs. I won't draw out the analogy by speaking of blows with the pick, or the charges laid against strings that are too responsive or too unresponsive. Instead, I will drop the analogy and say that I do not mean these people, but the ones we just said we were going to question about harmonics. You see, they do the same as the astronomers do. I mean, it is in these audible concordances that they search for numbers" (Plato, *Rep.* VII 529d7–531c4). The contrast "not to hearing but in the ratios involved" and the fact that astronomy and music are mentioned together suggest that Aristotle may have this exchange between Socrates and Glaucon in mind. The existence of several measures would then be due to there being some

units that are based on the least audible difference and others that are mathematical or “abstract.” This would explain—which is otherwise difficult to do—why Aristotle can comfortably claim that *all* magnitudes, in common with the diagonal of the square, have (at least) two measures.

**The voiced sounds (*hai phōnai*) by which we measure are several:** The *phōnai* referred to are presumably the phonetic elements mentioned a few lines earlier (B 3 998<sup>a</sup>25n), the measure of which is “a thing voiced (*phōnēen*)” (Iota 2 1054<sup>a</sup>2). One possibility is that these are the voiced letters or vowels, but another is that we are again in an area where we have perception-based auditory units on the one hand and on the other more theoretical units, as, for example, in prosody: “First, then, the prospective student of harmony must distinguish the movements of the voice (*phōnēs*), that is, with respect to place. For there is not just one type of this. For the voice moves in the way I mentioned both when we speak and when we sing (for high and low as are clearly present in both of these, and movement with respect to place is that through which high and low come about), but the two movements are not the same in form. Up to now no one has ever defined what the distinguishing feature of each of them is. And yet if this is not defined it is not at all easy to say what a note (*phthoggos*) is” (Aristoxenus, *Elementa Harmonica*, I.3, 5–21 = Barker 127). Aristotle’s “voiced sounds by which we measure” may be what Aristoxenus refers to as a *phthoggos* (A 9 993<sup>a</sup>5–7, notice *phthoggon* at 993<sup>a</sup>6). The two quarter-tones Aristotle refers to are probably those distinguished by Aristoxenus (I.21) as the enharmonic (which is a quarter-tone) and the chromatic (which is a one-third-tone).

**The diagonal is measured by two measures:** Reading ἡ διάμετρος δυοῖ μετρεῖται [καὶ ἡ πλευρά] with Furth, for OCT ἡ διάμετρος δυοῖ μετρεῖται καὶ ἡ πλευρά (“the diagonal is measured by two measures and so is the side”).

#### Note 1050

**A foot must be placed among the things that are perceptually indivisible:** Reading τὸ δ' εἰς ἀδιαίρετα πρὸς τὴν αἴσθησιν θετέον with Ross for OCT τὸ δ' εἰς ἀδιαίρετα πρὸς τὴν αἴσθησιν ἑθέλει.

**As has already been said:** At 1052<sup>b</sup>33, 1053<sup>a</sup>5.

#### Note 1051

**A number is a plurality of units:** See Z. 13 1039<sup>a</sup>12.

#### Note 1052

**Protagoras says that “man is the measure of all things”:** See Γ 5 1009<sup>a</sup>6–16.

#### Note 1053

**People who say what Protagoras says, then, are saying nothing, though they appear to be saying an extraordinary thing:** “Man is the measure of all things” is true if and only if “man” means “man who has scientific knowledge” or “man who has perception,” since a man without scientific knowledge or perception will measure inaccurately or falsely. But once the needed qualifications are added, the claim becomes empty. For scientific knowledge and perception are both truth ensuring: what we know must be true, what we perceive (as opposed to

seeming to perceive) must be so. What makes scientific knowledge or perception an accurate or truth-ensuring measure, however, is the underlying object: “it is not because we truly think you to be pale that you are pale, but it is because of your being pale that we who say this grasp what is true” (Θ 10 1051<sup>b</sup>6–9). Scientific knowledge and perception are more measured by their object, therefore, than it is by them.

# Note 1054

**With regard to the substance and the nature of the one, however, it must be investigated in which of two ways it stands, just as in going through the puzzles we went through what the one is and how we should get a grasp on it:** See B 4 1001<sup>a</sup>4–1001<sup>b</sup>25 (= [P11]).

**One says that the one is love (*philia*), another air, and another the unlimited:** Empedocles (A 6 985<sup>a</sup>27–28), Anaximenes (A 3 984<sup>a</sup>5), Anaximander (Iota 1 1052<sup>b</sup>10n).

# Note 1055

**As has been said in the accounts concerned with substance and with being:** See Z 13.

# Note 1056

**Nor—due to the same causes as in the case of being and substance—can the one be a genus:** See B 3 998<sup>b</sup>22–999<sup>a</sup>23.

# Note 1057

**Among colors, the one is a color—for example, white—and then the other colors are seen to come to be from this and black, and black is the lack of white, just as dark is of light:** See Δ 10 1018<sup>a</sup>24–25n.

# Note 1058

**In the case of sounds, the beings would be a number of phonetic elements, and the one would be a thing voiced:** See Iota 1 1053<sup>a</sup>16–17n.

# Note 1059

**That the one in a way signifies the same as being is clear:** See Γ 2 1003<sup>b</sup>22–34, Z 4 1030<sup>b</sup>10–12, K 3 1061<sup>a</sup>18.

# Note 1060

**Oppositions are of four sorts:** See Δ 10 1018<sup>a</sup>20–21, *Cat.* 10 11<sup>b</sup>17–19.

**And one of these is said of things as a lack, they must be contraries:** If A lacks F altogether, A is not-F, and F and not-F are contraries (Γ 2 1004<sup>a</sup>12n), but A can lack F without lacking it altogether (Iota 4 1055<sup>b</sup>14–16, 26–27).

**They must be contraries, and be said neither as contradictory nor as relatives:** Reading ἐναντία ἄν εἴη καὶ οὔτε ὡς ἀντίφασις οὔτε ὡς τὰ πρὸς τι λεγόμενα with Ross for OCT οὔτε ὡς ἀντίφασις οὔτε ὡς τὰ πρὸς τι λεγόμενα, ἐναντία ἄν εἴη.

# Note 1061

**As we diagrammed in our division of the contraries:** See Γ 2 1004<sup>a</sup>2n.

## Note 1062

**Things are said to be the same in many ways:** See also  $\Delta$  9, *Top.* I 7, V 4 133<sup>b</sup>15–134<sup>a</sup>4.

## Note 1063

**We sometimes say that the thing is the same with respect to number:** Since it is contrasted with being one both in number and in account, this is the sense, presumably, in which we say A is the same as B when A and B are coincidentally one ( $\Delta$  6 1015<sup>b</sup>17–36).

## Note 1064

**The account of their primary substance is one:** The primary substance is the form or essence ( $Z$  7 1032<sup>b</sup>1–2).

**Equal straight lines are the same, as are equal and equiangular quadrilaterals, although they are many:** If ABCD and EFGH are equiangular quadrilaterals, in geometry they are congruent or the same, even though they are numerically distinct parcels of intelligible matter ( $Z$  10 1036<sup>a</sup>11n). This is because geometry is interested only in the form (or primary substance) of the various plane figures and not in their matter. Hence formal equality or congruity constitutes oneness.

## Note 1065

**Things are similar:** See also  $\Delta$  9 1018<sup>a</sup>15–18.

## Note 1066

**Things in which more and less occurs:** See  $H$  3 1044<sup>a</sup>10n.

## Note 1067

**Things are also said to be DISTINCT [or OTHER] and DISSIMILAR in many ways:** See also  $\Delta$  9 1018<sup>a</sup>9–11.

## Note 1068

**Things are also said to be distinct unless both their matter and their account are one:** See  $Z$  8 1034<sup>a</sup>5–8.

## Note 1069

**The way the objects of mathematics are distinct from each other:** Cognate to the way in which such things are said to be the same (1054<sup>a</sup>35–<sup>b</sup>3).

## Note 1070

**Because of this, then, everything can be said to be distinct or the same in relation to everything:** Because things are said to be distinct or the same in opposite ways (1054<sup>b</sup>14–15).

## Note 1071

**Distinct is not the contradictory of same, which is why non-beings are not said to be distinct (whereas they are said to be not the same), but all beings are said to be distinct:** Suppose that A and B are non-beings. If they are distinct, then one of the following must be true: (1) they are distinct in number; (2) they are distinct in matter and form; (3) they are distinct as objects of mathematics are. But each of these involves A being one something and B being one something else. But “one”

and “being” follow along with each other ( $\Delta$  10 1018<sup>a</sup>35–38, K 3 1061<sup>a</sup>17–18). Therefore, (1) cannot be true of non-beings, and neither can (2) or (3). These considerations do not apply to saying that A and B are not the same.

Note 1072

**Things differ in genus if they do not have their matter in common and if there is no coming to be from one to the other:** A thing's genus  $G_1$  is part of its substance or essence (1054<sup>b</sup>30–31). So change in genus from  $G_1$  to  $G_2$  would have to be substantial change (coming to be, passing away). Substantial change is possible if and only if there is a parcel of persisting matter  $m$  to serve as underlying subject of the change, so that  $m$  is the matter of  $G_1$  and of  $G_2$  (H 1 1042<sup>b</sup>5–6n). Hence if there is no such  $m$ , change from  $G_1$  to  $G_2$  is impossible, and vice versa.

**That is, things whose figure of predication is not the same:** See A 1 981<sup>a</sup>3(7).

Note 1073

**Contraries are different and contrariety is a sort of difference:** See also  $\Delta$  10 1018<sup>a</sup>25–35.

Note 1074

**It is clear from induction that this hypothesis is correct:** See A 9 992<sup>b</sup>33n.

Note 1075

**Other contraries are in the same line of predication** (*sustoichia*[*i*] *tês katêgorias*): A line (column) of predication seems to be the same as a figure of predication (1054<sup>b</sup>29). On *sustoichia*, see A 5 986<sup>a</sup>23n.

Note 1076

**It has been determined elsewhere what sorts of things are the same or distinct in genus:** In  $\Delta$  9.

Note 1077

**Things that differ in genus do not have a route to each other:** If A is in genus  $G_1$  and B is in genus  $G_2$  and  $G_1 \neq G_2$ , then A and B do not have the same underlying matter, and so cannot change into (or have no route to) each other (Tota 3 1054<sup>b</sup>28–29).

Note 1078

**What is greatest in each genus is complete:** On completeness, see  $\Delta$  16.

Note 1079

**Things are said to be contraries in many ways:** See 1055<sup>a</sup>24–33.

Note 1080

**There cannot be more than two extremes of the same extension** (*diastêmatos*): A *diastêma* in music is an interval (*Pr.* XIX 47 922<sup>b</sup>6) and in spatial magnitudes, a dimension (*Ph.* IV 1 209<sup>a</sup>4). By extension, just as there are extreme and middle terms in a syllogism, so syllogisms themselves are *diastêmata* or intervals connecting the minor term to the major term (*APr.* I 25 42<sup>b</sup>10) and premises are sub-intervals of those intervals, so that *protasis* (“premise,” “proposition”) and

*diastêma* are equivalent (I 4 26<sup>b</sup>1). Terms, as sub-intervals of those sub-intervals, are also *diastêmata*, so that the number of terms in a sequence of syllogisms is equal to the number of *diastêmata* in them (I 25 42<sup>b</sup>1–26). Here the relevant *diastêma* is perhaps closest to what we would think of as the extension of a predicate, so that the extension between two contraries is the conjunction or union of their individual extensions.

#### Note 1081

**It has been shown that in relation to things outside the genus there is no difference:** This says: (1) if A differs from B, then A and B must be in the same genus G. Yet (2) a genus  $G_1$  can differ from a genus  $G_2$  (1055<sup>a</sup>6). (1) and (2) are apparently inconsistent.  $\Delta$  9 allows, however, that the one respect that must be the same in differing things may be neither a species nor a (first-order) genus but an analogical unity U of some sort (1018<sup>a</sup>13).  $G_1$  and  $G_2$  could thus differ in U rather than in genus. On analogical unities and their importance, see E 1 1026<sup>a</sup>27n.

#### Note 1082

**The science that is one science is also concerned with one genus:** See A 1 981<sup>b</sup>29n,  $\Gamma$  2 1003<sup>b</sup>19–20n.

#### Note 1083

**Both what is entirely incapable of having something and what is naturally such as to have it but yet does not have it, is lacking in it:** If A is entirely incapable of having B, then in the strict sense of “lack” A does not lack B, since to lack B in the strict sense A must be the sort of thing that can have B. When A cannot have B, what is strictly speaking true is that A is not B (contradictory), not that A is not-B (contrary).

**We are already saying that something lacks something in many ways, which we have distinguished elsewhere:** See  $\Delta$  22.

#### Note 1084

**It is the extremes from which the changes proceed that are contraries:** A person X may be partly blind or purblind and so lack sight to some degree without lacking it entirely. If X has the contrary of sight, on the other hand, he is non-sighted, or entirely blind. Since a contrary is a total or entire lack, every case of contrariety involves a lack. But since lacking comes in degrees, not every lack involves contrariety.

#### Note 1085

**On the one hand inequality is the contrary of equality, and unlikeness of likeness, but on the other, vice is the contrary of virtue, and these cases differ in the way that has been stated:** At 1055<sup>b</sup>4–6.

#### Note 1086

**It is one case of contrariety if the thing is lacking in the controlling part:** See A 2 982<sup>b</sup>7n,  $\Delta$  9 1018<sup>a</sup>18n, Z 10 1035<sup>b</sup>25n.

#### Note 1087

**The others lead back to these:** See H 2 1042<sup>b</sup>31–1043<sup>a</sup>4n.

Note 1088

**The puzzle supports those who say that the unequal is a dyad:** Namely, Platonists (N 1 1087<sup>b</sup>7).

Note 1089

**No contrariety is either seen to be intermediate or, from its definition, can possibly be so:** Contrariety is by definition the greatest difference between two terms (Iota 4 1055<sup>a</sup>3–5), and so contraries are the extremes between which things are intermediate, not intermediates between other extremes.

**Since it would not be complete if it were intermediate between something:** See Iota 4 1055<sup>a</sup>3–17.

Note 1090

**There are always three cases:** Whether A is greater than or equal to B; whether A is less than or equal to B; whether A is greater than or less than B.

Note 1091

**The equal is not a necessary lack of the greater or the less:** A necessary lack is not a lack in the strict sense, but one where B and its lack form a contradictory pair, so that if A lacks B, then A is not B (Iota 4 1055<sup>a</sup>4n).

Note 1092

**Things are said to be good or bad in many ways and their receptive subject is not one:** “Good is said of things in as many ways as being. For it is said of things in the category of what it is (for example, the god and the understanding), in that of quality (the virtues), in that of quantity (the moderate amount), in that of relation (the useful), in that of time (the opportune moment), in that of place (a livable dwelling), and so on. Thus it is clear that it will not be some common universal—that is, a one. For then it would not be said of things in all the categories but only in one” (NE I 6 1096<sup>a</sup>23–29).

Note 1093

**The things of which the neither black nor white is said as a lack (*sterêtikós*) are in a way definite:** What is said to be neither black nor white is some definite range of colors (gray, ochre, or the like) intermediate between the two. These are receptive subjects of the predicate “neither black nor white.” Because this range of subjects is more definite than that of neither good nor bad (for example, it falls within the single category of quality rather than cutting across many categories), it is closer to being one (it is more one) than the latter is. It is said *sterêtikós* when it is predicated not as a “necessary lack” but as a lack in the strict sense (1056<sup>a</sup>20n).

Note 1094

**Those people are incorrectly evaluating the matter who think that all such phrases are said of things in the same way:** If Aristotle has a definite group in mind—and is not simply pointing out that anyone who thinks this is mistaken—its identity is unknown.



## Note 1095

**In one there is a joint denial of opposites between which there is a certain intermediate and a certain natural extension (*diastêma*):** See Iota 4 1055<sup>a</sup>21n.

**Between the other two there is not a difference, since the things jointly denied are in different genera:** See the definition of difference at Iota 3 1054<sup>b</sup>23–1055<sup>a</sup>2. **So that the underlying subject is not one:** See Iota 3 1054<sup>b</sup>28–30n.

## Note 1096

**The one will then be few in the singular [so to say] or in the plural:** Literally, the one will then be few (*oligon*: singular) or few (*oliga*: plural). *Oligon* is used it seems because of the grammatical awkwardness of predicating the plural *oliga* of the (singular) one.

## Note 1097

**In relation to what are the two many if not in relation to the one and the few? For there is nothing smaller (*elatton*):** The one is smaller but not fewer than the two (1057<sup>a</sup>1–2).

## Note 1098

**Whatever is much is also many, and the many much (unless, indeed, there is a difference in the case of something continuous and easily bounded (*euhoristô[i]*):** “The wet [= liquid] is what is not bounded by any boundary of its own but is easily bounded (*euhoriston*), whereas the dry [= solid] is what is easily bounded by a boundary of its own, but is difficult to bound (*dushoriston*)” (GC II 2 329<sup>b</sup>30–32).

## Note 1099

**Each number is said to be many because of ones:** That is, because it is composed of a plurality of ones or units.

**And in a way that is opposed to the one, not to the few:** Being a number of Fs is opposed to being one F, not to being a few Fs. For two, and not one, is the first number that is a few (1057<sup>a</sup>1–2).

## Note 1100

**In this way, then, even the two are many, but in the way of a plurality that has an excess, either in relation to something or unconditionally, they are not:** A plurality or a many  $P_1$  has an excess in relation to a plurality  $P_2$  if and only if  $P_1$  is a larger many (or has a greater number of members) than  $P_2$ .  $P_1$  has an excess unconditionally if and only if there is no plurality  $P_x$  such that  $P_x$  has an excess in relation to  $P_1$ . If  $P_1$  has just two members there is no plurality  $P_x$  such that  $P_1$  is a larger many than  $P_x$ , whereas there is a  $P_y$  such that  $P_y$  is a larger many than  $P_1$ .

**The two are the first plurality:** If  $P_1$  has just two members, then for every plurality  $P_x$ ,  $P_1$  is a smaller many than  $P_x$ . So the two is the first or smallest plurality.

## Note 1101

**The two are few, since they are the first plurality with a deficiency:**  $P_1$  has a deficiency (unconditionally) if and only if there is no plurality  $P_x$  such that  $P_x$  is a smaller many (has fewer members) than  $P_1$ .

Note 1102

**Anaxagoras incorrectly abandoned his task when he said that “all things were together, unlimited both in plurality and in smallness”:** DK B1 = TEGP 11 F1.

Note 1103

**Instead of “and in smallness” he should have said “and in fewness”:** Aristotle’s point is not entirely clear, but may be this. If Anaxagoras had not abandoned his task, incorrectly thinking it finished, he might have noticed that X is unlimited in smallness could mean (1) X is unlimited in smallness of size, or (2) X is unlimited in smallness of number, or fewness. Reflection on (1) might then have led him to discover its unacceptable consequences (*Ph.* I 4 187<sup>b</sup>7–188<sup>a</sup>18), one of which is that “there will be an unlimited multitude of finite equal parts in a finite quantity—which is impossible” (187<sup>a</sup>33–34). It cannot be, then, that X is (1) unlimited in smallness, so that however small any Y is X is always smaller than it. Instead, X must simply be an indivisible unit or one. Turning then to (2) Anaxagoras might have reflected along the lines of the argument of Iota 6 that this indivisible one cannot be unlimited in fewness, since two not one is the smallest few, even though one is less than it (1057<sup>a</sup>1–2). Hence the conclusion of the next sentence, “the few is not [what it is] because of the one, as some say, but because of the two.”

Note 1104

**We have determined elsewhere that things are said to be relatives in two ways, [1] some as contraries, [2] others in the way that scientific knowledge is related to the scientifically knowable:** The distinction is between cases like [1] double and half and [2] scientific knowledge and the scientifically knowable, previously discussed at Δ 15 1021<sup>a</sup>26–<sup>b</sup>3. [1] Double and half are intrinsically relative, since each is essentially related to the other: the double is the double of the half; the half is the half of the double. [2] Scientific knowledge, by contrast, is only relative because something else, the scientifically knowable, is relative to it: the scientifically knowable is what there can be scientific knowledge of. A given scientifically knowable thing, though, is prior to the scientific knowledge of it (1057<sup>a</sup>7–12). [1] is explained at Iota 7 1057<sup>a</sup>37–<sup>b</sup>1.

Note 1105

**Number is plurality that is measurable by one:** See Iota 1 1052<sup>b</sup>31–1053<sup>a</sup>2.

Note 1106

**All scientific knowledge is scientifically knowable but not all that is scientifically knowable is scientific knowledge:** The point is more clearly made in the following text: “It does not seem to be true of all relatives that they are by nature at the same time. For the scientifically knowable would seem to be prior to scientific knowledge, since for the most part it is of things that hold antecedently that we acquire scientific knowledge, and in few cases, if any, do we see the scientific knowledge coming to be at the same time as the thing that is scientifically knowable. Further, doing away with the scientifically knowable thing does away with the scientific knowledge too, but doing away with the scientific knowledge does not do away with the scientifically knowable thing. For if there is not a

scientifically knowable thing there is no scientific knowledge either, since there will not be anything for scientific knowledge to be of, whereas if there is not scientific knowledge, nothing prevents there from being a scientifically knowable thing. Take, for example, the squaring of the circle, if it is scientifically knowable. There is not yet scientific knowledge of it, but it is scientifically knowable" (*Cat.* 7 7<sup>b</sup>22–33).

#### Note 1107

**Intermediates must be composed of the contraries:** Established on the basis of [1], which is based on [1a] and [1b], [2], and [3], which is based on [3a] and [3b].

#### Note 1108

**To change from one genus to another genus is not possible:** See *Iota* 3 1054<sup>b</sup>28–29.

**Except coincidentally, as from a color to a shape:** If a red thing becomes round it changes coincidentally, because it is not insofar as it is red that it changes, but insofar as it was some shape other than round.

#### Note 1109

**All intermediates are between opposites of some sort, since from these alone intrinsic changes can take place:** See *Γ* 7.

#### Note 1110

**The contrary species as species of a genus:** See *Z* 12 1038<sup>a</sup>5n.

#### Note 1111

**White is a dilating color and the black a compressing color:** The reference is to Plato's theory: "The parts that move from the other objects and impinge on the ray of sight are in some cases smaller than, in others larger than, and in others equal in size to, the parts of the ray of sight itself. The ones that are equal in size are imperceptible, and these we of course call transparent. Those that are larger or smaller, by contrast, respectively contract and dilate the ray of sight, and so are quite similar to what is cold or hot in the case of the flesh [touch], and, in the case of the tongue [taste], to what is sour, or to all those things that generate heat and that we have therefore called pungent. So black and white, it turns out, are really the same as these other attributes, though of a different kind (*genos*), which is why they present a different appearance. This, then, is how we should speak of them: white is what dilates the ray of sight, and black is what does the contrary" (*Ti.* 67d2–e6).

#### Note 1112

**Things that are in the same genus must be composed of things of which the genus is not a component:** Suppose that  $S_1$  and  $S_2$  are in the same genus  $G_1$  and so are distinct species of  $G_1$ . Then  $S_1$  is composed of  $G_1$  and its ultimate differentia  $D_1$  and  $S_2$  is composed of  $G_1$  and its distinct ultimate differentia  $D_2$ . But  $D_1$  and  $D_2$  are not composed of  $G_1$  (*Z* 12 1038<sup>a</sup>19–20). Thus the species in  $G_1$  that are intermediate between  $S_1$  and  $S_2$  must be composed of differentiae that are intermediate between  $D_1$  and  $D_2$  ([3a]).

**Or else must be incomposite:** If  $S_1$  and  $S_2$  are incomposite, they cannot be composed of anything. More particularly, they cannot be composed of  $G_1$  and  $D_1$  or  $D_2$ . So they cannot be distinct species of the same genus after all.

Note 1113

Since there are no other things of the same genus that are prior to the contraries, all the intermediates must be composed of the contraries, so that all the things downstream too, both the contraries and the intermediates, will be composed of the primary contraries: [3b] deals with contraries  $C_1$  and  $C_2$  that are not in the same genus. Consequently, there cannot be anything in the same genus as  $C_1$  and  $C_2$  that is prior to them. Hence their differentia  $D_1$  and  $D_2$  must be primary differentiae. Now consider intermediates  $I_1$  and  $I_2$  that are between  $C_1$  and  $C_2$ . What makes it true that they are between  $C_1$  and  $C_2$ ? It cannot be that they are differentiae of the same genus, since  $C_1$  and  $C_2$  are not in the same genus, and so their intermediates cannot be either (as was shown in [2]). So it can only be something to do with  $D_1$  and  $D_2$  themselves? And what could that be other than the fact that they are composed of the primary contraries  $C_1$  and  $C_2$ ?

Note 1114

**What is distinct (*heteron*) in species is distinct from something (*tinon*), in something (*ti*):** *Heteron* also means “other” ( $\Delta$  9 1018<sup>a</sup>9–11), so we could translate: “What is other in species is other than something in something.” The second “something” is the genus to which the distinct species belong.

Note 1115

**A genus . . . is not coincidentally differentiated:** See Z 12.

**Whether as matter or otherwise:** See  $\Delta$  28 1024<sup>b</sup>8–9.

Note 1116

**The common thing, must be reciprocally distinct in species:** Compare Z 14 1039<sup>a</sup>26–30.

Note 1117

**This differentia, therefore, will be a contrariety:** What follows seems to be the intended proof, not what precedes. It shows that all division is by opposites and the contraries are in the same genus. But it does not show explicitly that contraries are the only opposites that are in the same genus, and so fails to show that a differentia must be a contrariety. But this Aristotle may think is obvious. For relatives are obviously not in the same genus (Iota 7 1057<sup>a</sup>37–38) and neither are contradictories, since an attribute either belongs or does not belong to everything, regardless of genus. An attribute and its lack, on the other hand, must be in the same genus ( $\Gamma$  2 1004<sup>a</sup>9–20), but since contrariety is complete lack ( $\Theta$  2 1046<sup>b</sup>14–15, Iota 4 1055<sup>a</sup>33–35) all lacks are either contraries or fall between them, and so are composed of them (Iota 7).

Note 1118

**It has been shown that contraries are in the same genus:** In Iota 4.

## Note 1119

**All contraries that are different in species and not in genus are in the same line of predication:** See Iota 4 1054<sup>b</sup>35n.

## Note 1120

**This is what it is for things to be distinct in species (*eidei*), namely, to have a contrariety while being in the same genus and being indivisible (*atoma*) (whereas those things are the same in species (*eidei*) that do not have a contrariety and are indivisible):** Since things can be indivisible (1) in species (or form) or (2) in number (Iota 1 1052<sup>a</sup>31), both species (*APo.* II 13 96<sup>b</sup>15–16) and individual particulars (*Cat.* 2 1<sup>b</sup>6–7) can be *atoma*. The focus of 1058<sup>a</sup>21–26, however, is clearly on (1), where sameness “in species (*eidei*)” (1058<sup>a</sup>26) is a relationship between two species. So even though it may seem strange to speak of species as being the same *in species*, the present text should also be understood as dealing with (1) not with (2). See also the reference to “the ultimate indivisible thing” at Iota 9 1058<sup>b</sup>10.

## Note 1121

**None of the species as species of a genus is either the same as or distinct from the genus in species (and this is as it should be, since the matter is made clear by denial):** The claim is (1) no species *S* of genus *G* is such that either *S* = *G* in species *S<sub>x</sub>* or *S* ≠ *G* in species *S<sub>x</sub>*; and (2) this is as it should be because (1), as a denial, makes the matter clear. The thought is this (Iota 9 1058<sup>b</sup>1–21). *S* consists of a formal component *F* and a material component *m*, so whatever relation *S* has to *G* must depend either on *F* or on *m*. If it depends on *F*, either *S* = *G* in *F* or *S* ≠ *G* in *F*. But since form determines species, this entails (substituting *S<sub>x</sub>* for *F*) that (1) is false. It must be, then, that *S*’s relationship to *G* is determined by *m*. This is what (1) makes clear.

**The genus is the matter of what it is said to be the genus of:** See Z 12 1038<sup>a</sup>5–9.

**Not as in “the genus of the Heraclidae”:** The genus or family studied by genealogists, consisting of the descendants of Heracles.

**But as in “the genus that is included in the nature of that thing”:** The genus that together with the differentiae constitute a nature.

## Note 1122

**Since one component is the account (*logos*) and the other the matter:** The *logos* here, as at 1058<sup>b</sup>10, is properly speaking the ontological correlate of the *logos*, which is the form or species (Δ 6 1015<sup>b</sup>25n).

**The matter:** That is, the genus (Δ 28 1024<sup>b</sup>9, Z 12 1038<sup>a</sup>6–7).

**Contrarieties that are in the account produce a differentia in species, but those that are in the combination with the matter do not produce one:** Relied on at Iota 8 1058<sup>a</sup>23–24.

**The combination with the matter:** See E 1 1025<sup>b</sup>32.

## Note 1123

**Nor is there a difference with regard to species between the pale human and the dark human, not even if a single name is assigned to them:** See Z 4 1029<sup>b</sup>27–1030<sup>a</sup>1.

Note 1124

**Callias, by contrast, is the account with the matter; so too, then, is the pale human—because Callias is pale, and so the human is such coincidentally:** Callias is the compound of matter and account (= form) (Z 8 1034<sup>a</sup>5–8). Since he is human his form is the universal human species form (1033<sup>b</sup>24–26). Since he and the (particular instance of) pale happen to coincide, he is coincidentally pale (Γ 4 1007<sup>b</sup>4n). Hence the human and the pale coincide. Hence the human is coincidentally pale.

Note 1125

**The same seed becomes female or male when it is affected in regard to a certain attribute:** See Z 9 1034<sup>a</sup>33–<sup>b</sup>4n.

Note 1126

**Since, though, [1] contraries are distinct in species (*eidos*), and [2] the capable of passing away and the incapable of passing away are contraries (for [3] a lack is a definite incapacity), [4] the capable of passing away and the incapable of passing away must be distinct in genus (*genos*):** [1] If A and B are contraries, A and B must be distinct species of the same genus (Iota 4 1055<sup>a</sup>26–27) and B must be the lack of A (or A of B) (1055<sup>b</sup>26–27). [2] The capable of passing away and the incapable of passing away are contraries, since [3] the incapable of passing away is the definite lack of the capable of passing away. It would seem to follow that [5] the two must be in the *same* genus. Yet the conclusion drawn is that [4] they must be *different* in genus. One way to resolve the conflict between [4] and [5] is to regard *eidos* and *genos* as having not the technical meanings of “species” and “genus,” but rather “form” and “kind” (respectively). But this gives rise to an immediate difficulty, since in the final sentence of the chapter the two terms must have their technical meanings (1059<sup>a</sup>14). A different approach is to treat [1]–[4] as embodying an implicit puzzle of the following sort: “Since, though, contraries are distinct in species (*eidos*), and the capable of passing away and the incapable of passing away are contraries (for a lack is a definite incapacity), [a puzzle arises because in fact] the capable of passing away and the incapable of passing away must be different in genus.” Crucial here is 1058<sup>b</sup>36–1059<sup>a</sup>10, which shows, in effect, that the capable of passing away and the incapable of passing away are not contraries in the way required by [1].

Note 1127

**Now so far we have been speaking of the universal names (*tôn katholou onomatôn*) themselves:** The “universal names” should be taken with the things that “have the same name (*homōnuma*)” referred to at 1059<sup>a</sup>14, and with “one name (*onoma hen*)” at Iota 9 1058<sup>b</sup>5. Hence they are names that apply to universals (including universal Platonic Forms) and particulars alike. When we speak of those, without distinguishing which of their applications we have in mind, confusions may result—confusions which Aristotle now proceeds to sort out, by returning to the cases of the pale and the dark, which he has already employed in Iota 9.

Perhaps it might seem not to be necessary for whatever is incapable of passing away and whatever is capable of passing away to be distinct in species, just as with pale and dark: Notice that the focus is right away on [2], exploring one reason why we might think it to be false. This reason is accepted for contraries, such as pale and dark, which belong coincidentally, but rejected for contraries, such as capable of passing away and incapable of passing away, which either are or are not in the substance or essence of what they belong to.

#### Note 1128

The same thing can be both, and, at the same time, if it is a universal, just as the human can be both pale and dark: “The human” here is to be understood as referring to the universal, as at Iota 9 1058<sup>b</sup>12.

#### Note 1129

Hence insofar as (*hêfi*), and with reference to the primary thing [due to which] (*kath’ ho próton*), one thing is capable of passing away and another incapable of passing away, they have an antithesis, and so must be distinct in genus: The primary thing or capacity (@ 1 1046<sup>a</sup>9–16) due to which A is capable of passing away while B is incapable of it is that A has the sort of matter required for passing away, while B does not (H 1 1042<sup>a</sup>32–<sup>b</sup>6). Since genus has already been identified with matter (Iota 8 1058<sup>a</sup>23–24), this difference between A and B is one of genus, as [4] (1058<sup>b</sup>28–29) claims. But the antithesis between having the relevant sort of matter and lacking it is a contradictory one, since it has no intermediate (7 1057<sup>a</sup>34–36). In fact, this is just what [3] (1058<sup>b</sup>27–28) entails, since a lack that is a definite incapacity, in contrast to one “taken in combination with the receptive subject,” is one side of a contradiction (4 1055<sup>b</sup>7–11). The contraries that [1] (1058<sup>b</sup>26) refers to, however, are contraries that are in the same genus precisely because they are taken in combination with the receptive subject. This solves the puzzle.

#### Note 1130

There cannot be Forms of the sort that some people say there are, since then it would be the case that one man is capable of passing away and another incapable of passing away: Particular perceptible men are capable of passing away, whereas the Platonic Form of a man (the man-itself) is eternal and incapable of passing away (for example, A 9 991<sup>b</sup>12–13, B 2 997<sup>b</sup>7–8).

#### Note 1131

The Forms are said to be the same in form with the particulars and not merely to have the same name: See A 6 987<sup>b</sup>7–10, 9 990<sup>b</sup>6.

### BOOK KAPPA (XI)

#### Note 1132

**Book Kappa:** K is not unambiguously referred to in any other book of the *Metaphysics* but does itself refer to the contents of A 3–10 (1 1059<sup>a</sup>18–20) and, though

less certainly, to those of A 6–7 (7 1064<sup>a</sup>36). It consists of two quite different parts: (1) 1059<sup>a</sup>18–1065<sup>a</sup>26 (roughly the first eight chapters) contains a shorter version of the contents of BFE, but rearranges topics, omitting some, and adding some of its own, as indicated in the relevant notes. (2) 1065<sup>a</sup>26–1069<sup>a</sup>14 (roughly the last four chapters) contains a series of extracts taken almost verbatim from *Physics* II, III, and V. The two parts are joined together by a transition from a discussion of the coincidental to a discussion of chance.

Note 1133

**Our first discussions:** A 3–10.

Note 1134

**P<sub>1</sub>:** Compare B 2 996<sup>a</sup>18–<sup>b</sup>26 (= [P1]).

Note 1135

**P<sub>2</sub>:** Compare B 2 996<sup>b</sup>26–997<sup>a</sup>15 (= [P2]).

Note 1136

**P<sub>3</sub>:** Compare B 2 997<sup>a</sup>15–25 (= [P3]).

Note 1137

**P<sub>4</sub>:** Compare B 2 997<sup>a</sup>25–34 (= [P5]).

Note 1138

**For insofar as theoretical wisdom is demonstrative, it is concerned with the coincidentals, whereas if it is concerned with the primary things, it is of substances:** Reading ἡ μὲν γὰρ ἀποδεικτική, ἡ σοφία ἢ περὶ τὰ συμβεβηκότα· ἡ δὲ περὶ τὰ πρῶτα, ἡ τῶν οὐσιῶν with Ross for OCT εἰ μὲν γὰρ ἀποδεικτική, σοφία ἢ περὶ τὰ συμβεβηκότα· εἰ δὲ περὶ τὰ πρῶτα, ἡ τῶν οὐσιῶν (“if theoretical wisdom is demonstrative, it is concerned with the [intrinsic] coincidentals, whereas if it is concerned with the primary things, it is of substances”).

**Primary things:** See A 2 982<sup>a</sup>25–<sup>b</sup>7, Z 4 1030<sup>a</sup>10–11n.

Note 1139

**We must not posit, either, that the science we are inquiring into is concerned with the causes mentioned in our works on nature:** Compare B 2 996<sup>a</sup>21–<sup>b</sup>1 (= part of [P1]).

**The causes mentioned in our works on nature:** That is, the formal, final, efficient, and material causes (A 3 983<sup>a</sup>24–<sup>b</sup>1, 10 983<sup>a</sup>11–13). The claim is that theoretical wisdom should not be posited or assumed to deal with *all* four of these causes, on the grounds that it deals with immovable things, and these obviously have no first, or prime, mover. This does not mean that one of these immovable things cannot itself be the prime mover of other things, but it does seem to imply that it is not insofar as it is a prime mover that theoretical wisdom gets a theoretical grasp on it.

Note 1140

**P<sub>5a</sub>:** Compare B 2 997<sup>a</sup>34–998<sup>a</sup>19 (= [P4]).



## Note 1141

**P<sub>6</sub>:** Compare B 2 997<sup>b</sup>12–19 (= part of {P4}).

**Nonetheless, there is a puzzle:** Reading ὁμῶς δὲ ἀπορίαν ἔχει with Ross for OCT ὁλῶς δὲ ἀπορίαν ἔχει (“In general there is a puzzle”).

## Note 1142

**The science we are inquiring into is not concerned with the objects of mathematics either, since none of them is separable, nor about the perceptible substances, since they are capable of passing away:** See E 1 1025<sup>b</sup>18–1026<sup>a</sup>32, and on separability, Z 1 1028<sup>a</sup>34n.

## Note 1143

**P<sub>7</sub>:** No parallel in B.

**The matter of the objects of mathematics:** See Z 10 1036<sup>a</sup>11n.

## Note 1144

**The entire work of the natural scientist is concerned with things that have within themselves a starting-point of movement and of rest:** Such a starting-point is just what a nature is (Δ 4 1015<sup>a</sup>13–19).

**Nor yet to the science that investigates demonstration and scientific knowledge, since this is the kind of thing that it produces its investigation about:** The science referred to is analytics (for example, Γ 3 1005<sup>b</sup>2–5, 1005<sup>b</sup>35–1006<sup>a</sup>11), and the kind of thing it investigates is the one to which demonstration and scientific knowledge belong. Demonstration is investigated in *Prior Analytics*, scientific knowledge in *Posterior Analytics*.

## Note 1145

**It is the philosophy proposed here (*prokeimenên philosophian*) that conducts the investigation into those issues:** See Γ 2 1004<sup>a</sup>2–4, E 1 1026<sup>a</sup>18–32.

## Note 1146

**P<sub>8</sub>:** Compare B 3 998<sup>a</sup>20–999<sup>a</sup>23 (= [P6] and [P7]).

## Note 1147

**It might seem that the science we are inquiring into . . . would thus be of the primary genera:** The primary genera are the categories (B 3 998<sup>b</sup>15n).

**Every account and every science is of universals and not of last things (*eschatôn*):** *Eschata* here are perceptible particulars (Z 15 1039<sup>b</sup>27–1040<sup>a</sup>7), whereas at 1059<sup>b</sup>35 they are the ultimate indivisible species (Iota 8 1058<sup>a</sup>18n).

## Note 1148

**Being and the one are primary in nature:** See Δ 11 1019<sup>a</sup>1–4.

## Note 1149

**P<sub>9</sub>:** Compare B 4 999<sup>a</sup>24–<sup>b</sup>24 (= [P8]).

## Note 1150

**Why this is impossible has been stated:** Presumably at K 1 1059<sup>b</sup>31–38.

Note 1151

P<sub>10</sub>: Compare B 2 997<sup>a</sup>34–998<sup>a</sup>19 (= [P4]) and B 4 999<sup>a</sup>24–<sup>b</sup>24 (= [P8]).

Note 1152

We seem to be inquiring into another sort of substance, and that this is what we proposed (to *prokeimenon*) to ourselves here: See K 1 1059<sup>b</sup>20–21.

Note 1153

The matter of bodies does not exist actively but potentially: See H I 1042<sup>a</sup>27–28, Θ 6 1048<sup>a</sup>35–<sup>b</sup>9.

Note 1154

The form and the shape would seem to be a starting-point in a more controlling way (*kuriôtera*) than matter: See A 1 981<sup>b</sup>11n.

Note 1155

Form is capable of passing away: The supposition in operation is that the starting-point that theoretical wisdom is concerned with is not separable from perceptible bodies (1060<sup>a</sup>19). Hence the form that seems to be in a fuller way such a starting-point is the form that is inseparable from such bodies (Z 15 1039<sup>b</sup>20–26).

Note 1156

It is inquired about by pretty much all the most sophisticated thinkers as being a starting-point and substance of this sort: See A 10 1075<sup>a</sup>24–27.

Note 1157

How will there be order without there being something eternal and separable and enduring?: See A 10 1075<sup>b</sup>24–27.

Note 1158

P<sub>11</sub>: Compare B 4 1000<sup>a</sup>5–1001<sup>a</sup>3 (= [P10]).

Note 1159

P<sub>12</sub>: Compare B 4–5 1001<sup>a</sup>4–<sup>b</sup>25 (= parts of [P11]).

Note 1160

Being is predicated of all things (as of some things (*kat' eniôn*) is the one as well): Since “all things are and are one” (K 1 1059<sup>b</sup>31) and being and the one are mutually entailing (3 1061<sup>a</sup>17–18), *kat' eniôn* is a bit mysterious.

Note 1161

P<sub>13</sub>: Compare B 5 1001<sup>b</sup>26–1002<sup>b</sup>11 (= [P14]).

The primary surfaces: “In *On Philosophy* (*en tois Peri philosophias legomenois*) it was determined that the animal-itself is composed of the Idea-itself of the one together with the primary length, breadth, and depth, and the other in the same way” (DA I 1 404<sup>b</sup>19–21). The reference is probably to Aristotle's own dialogue *On Philosophy*, which is referred to as *en tois Peri philosophias* at *Ph.* II 2 194<sup>a</sup>36.

## Note 1162

**There is a coming to be of every substance:** The meaning is presumably that every substance that comes to be does so through a process of coming to be (B 5 1003<sup>a</sup>28–<sup>b</sup>11, H 3 1043<sup>b</sup>14–18). For eternal substances (the primary god, the heavenly bodies) do not come to be (E 1 1026<sup>a</sup>15–18, A 6–8).

## Note 1163

**P<sub>14</sub>:** Compare B 6 1003<sup>a</sup>5–17 (= [P12]).

## Note 1164

**P<sub>15</sub>:** Compare B 4 999<sup>a</sup>24–<sup>b</sup>24 (= [P8]).

**I mean, the matter and what is with it (to meta tautês):** See *ho logos meta tês hulês* (“the account [= the form] with the matter”) at Iota 9 1058<sup>b</sup>10–11.

## Note 1165

**P<sub>16</sub>:** Compare B 4 999<sup>b</sup>24–1000<sup>a</sup>4 (= [P9]).

## Note 1166

**K 3:** Compare Γ 1–2.

## Note 1167

**Let the primary differentiae of being be taken as already theoretically grasped:** See Γ 2 1004<sup>a</sup>2n, 1004<sup>b</sup>27–1005<sup>a</sup>2.

## Note 1168

**In all such cases, accordingly, we must posit that the lack is not of the whole account (*holou logou*) but of the complete form (*tou teleutaïou eidos*):** The parts of the form correspond to the parts of the account (Z 10 1035<sup>b</sup>33–34). The complete form is what fits the whole account. A less than complete form fails to fit it in some specifiable respect that is part of it.

## Note 1169

**The just man is so in accord with a state [of character] that is obedient to the laws:** See NE V 1 1129<sup>b</sup>11–1130<sup>a</sup>13.

## Note 1170

**To get a theoretical grasp on the [intrinsic] coincidents of this qua being and on the contrarities that belong to it qua being belongs to no other science than philosophy (*philosophias*):** *Philosophia*, which usually has a broader connotation, is here used to refer to primary philosophy (A 2 982<sup>b</sup>11n).

## Note 1171

**Dialectic and sophistry are concerned with the coincidents of things:** See Γ 2 1004<sup>b</sup>17–26n.

## Note 1172

**The puzzle we stated at the start would seem to be resolved—I mean the puzzle as to how there can be one science of beings that are many and different in genus:** At K 1 1059<sup>a</sup>20–23.

Note 1173

K 4: Compare  $\Gamma$  3 1005<sup>a</sup>19–<sup>b</sup>2.

Note 1174

**The mathematician makes use of the common things (*koinos*) but in a special way:** *Koina* are beliefs or axioms common to all or to many sciences (B 2 996<sup>b</sup>26–997<sup>a</sup>11).

**It must belong to primary philosophy to get a theoretical grasp on these starting-points also:** Compare (A 2 982<sup>b</sup>11n).

Note 1175

**That when equals are subtracted from equals the remainders are equal, is common to all quantities, but mathematics, having cut off a part of its proper [subject-]matter, proceeds to produce theoretical knowledge (*theôria*) concerning this part:** More precisely, it is the special mathematical sciences that cut off a part of quantity, whereas universal mathematics deals with quantity as a whole, although still not qua being (E 1 1026<sup>a</sup>25–27n).

Note 1176

**Natural science too has the same way of inquiring (*tropos*) as mathematics:** See  $\alpha$  3 995<sup>a</sup>17n.

Note 1177

**There is a starting-point in the beings that we cannot be deceived about:** Compare  $\Gamma$  3 1005<sup>b</sup>8–1005<sup>b</sup>34.

Note 1178

**It is not possible to produce a deduction of this from a more convincing starting-point, and yet we at any rate must do so, if indeed we are to demonstrate it unconditionally:** See APo. I 2 72<sup>a</sup>37–<sup>b</sup>4, quoted in A 9 992<sup>b</sup>30–33n. Compare  $\Gamma$  4 1006<sup>a</sup>5–18.

Note 1179

**To show the person who states opposites that he speaks falsely, one must get the sort of thing from him that is the same as that it is not possible for the same thing to be and not to be at the same time, but that does not seem to be the same:** Compare  $\Gamma$  4 1006<sup>a</sup>18–26.

Note 1180

A<sub>1</sub>: Compare  $\Gamma$  4 1006<sup>a</sup>28–31 (= [A1]).

**The person, then, who says “it is this and it is not this,” says and denies that it is this, so that what the name signifies, he says it does not signify; and this is impossible:** What the denier of PNC must be gotten to agree to has to be the same as, while not seeming to be the same as, PNC, namely, that the name “N” signifies A (“this”) and only A. Using N he then affirms the denial of PNC. And as a result of his doing so, he says that N does not signify A. It must be, then, or so it seems, that in saying “it is this and it is not this” what he says is “N is A and N is not A.”

## Note 1181

A<sub>2</sub>: Compare Γ 4 1006<sup>a</sup>31–<sup>b</sup>34 (= [A2a]).

## Note 1182

**If the name signifies something and this states the truth, it must be that this is so of necessity. And what is so of necessity cannot for the relevant time (*pote*) not be so:** PNC involves a reference to time: B and not B cannot hold of A *at time t*. What the denier of it must be gotten to concede is identical or equivalent in force to PNC. In conceding that “N” signifies A, then, he should not be conceding that “N signifies A” is true of necessity, in the sense that it cannot “ever” (one meaning of the indefinite adverb *pote*) not be so, but rather that for the relevant time—namely, the time of the argument, however long or short it is—N cannot signify anything other than A. For that indefinite time (another meaning of *pote*), then, it is true of necessity that N signifies A.

## Note 1183

A<sub>3a</sub>: Compare Γ 4 1007<sup>b</sup>18–1008<sup>2</sup> (= [A3a]).

## Note 1184

**Maybe if we had questioned Heraclitus himself in this way we would have compelled him to agree that opposite affirmations can never state the truth about the same things:** Compare Γ 3 1005<sup>b</sup>23–26.

## Note 1185

A<sub>3b</sub>: Compare Γ 4 1008<sup>a</sup>4–7 (= [A3b]). However, A3b argues that if PNC is denied, then PEM must also be denied, whereas A<sub>3b</sub> argues that if PNC is denied, then its denial must also be denied.

## Note 1186

A<sub>4</sub>: Compare Γ 8 1012<sup>b</sup>13–18.

**Discussion** (*to dialegesthai*): See Γ 2 1004<sup>b</sup>19–22n.

## Note 1187

**The saying of Protagoras is quite similar to the views we have mentioned:** Compare Γ 5 1009<sup>a</sup>6–16, 22–30.

## Note 1188

**It seems to have come about in some cases from the beliefs of the physicists:** See A 5 986<sup>b</sup>14n.

## Note 1189

**We have said in our works on nature how things that come to be do so from what is not and how they do so from what is:** Compare Γ 5 1009<sup>a</sup>30–36. The works referred to are *Ph.* I 6–9, *GC* I 3 317<sup>b</sup>14–319<sup>b</sup>5.

## Note 1190

**In general, it is absurd to make the fact that the things we find around here are evidently changing and never remain the same the basis of our judgment about the truth:** Compare Γ 5 1010<sup>a</sup>25–32.

Note 1191

**If there is movement, there is also something moved, and everything is moved from something to something:** Compare  $\Gamma$  5 1010<sup>a</sup>35–<sup>b</sup>1.

Note 1192

**And if with respect to quantity the things we find around here continuously flow and move, why should they not remain the same with respect to quality?:** Compare  $\Gamma$  5 1020<sup>a</sup>22–25.

**That is, if we were to posit this even though it is not true:** Aristotle thinks that increase and decrease in size is stepwise rather than continuous (*Ph.* VIII 3 252<sup>b</sup>13–23).

Note 1193

**The substance depends on quality, and this is of a definite nature:** See  $\Delta$  14 1020<sup>a</sup>33–<sup>b</sup>1.

**Quantity is of an indefinite one:** A thing's size is not as definite and unchangeable as are the qualities (= differentiae) that are part of its substance or essence.

Note 1194

**When the doctor prescribes the taking of this food why do they take it?:** Compare  $\Gamma$  4 1008<sup>b</sup>12–27.

Note 1195

**If we are always altering and never remain the same, is it any wonder that to us, as to the sick, things never appear the same?:** Compare  $\Gamma$  5 1009<sup>a</sup>38–<sup>b</sup>33.

Note 1196

**The aforementioned change:** That we are always altering and never remain the same (1063<sup>a</sup>35–36).

Note 1197

**In the case of those who raise the aforementioned puzzles on the basis of argument, it is not easy to provide a resolution:** Compare  $\Gamma$  5 1009<sup>a</sup>16–22, 6 1011<sup>a</sup>3–16.

Note 1198

**They do away with discussion (to *dialegesthai*) and with argument in general:** See  $\Gamma$  2 1004<sup>b</sup>19–22n.

Note 1199

**In the case of those who are puzzled by the traditional puzzles, it is easy to confront and resolve the puzzles that are present in them—as is clear from what has been said:** At 1062<sup>b</sup>20–1063<sup>a</sup>7.

Note 1200

**It is evident from these considerations that opposite affirmations cannot state the truth about the same thing at one time:** Compare  $\Gamma$  6 1011<sup>b</sup>17–22.

**All contraries are said of things as a lack—as is clear if we lead the account of contraries back to their starting-point:** See *Iota* 4 1055<sup>b</sup>26–29.

## Note 1201

**Nothing medial between contraries can be predicated of one and the same thing [as one of the contraries]:** Compare  $\Gamma$  7 1011<sup>b</sup>23–1012<sup>a</sup>24, which shows that there cannot be a middle between contradictories. The present argument shows that a middle between contraries cannot be predicated of something at the same time as one of the contraries.

## Note 1202

**The second of the two things we have combined is truly stated of it, and this one is the contradictory of white:** The things we have combined are black and white, and the way we have combined them is by neither\_ nor\_. But neither black nor white is equivalent to both not black and not white, and the second of these, not white, is the contradictory of white.

## Note 1203

**In accord with Heraclitus:** See K 5 1062<sup>a</sup>31–<sup>b</sup>5.

**In accord with Anaxagoras:** 1063<sup>a</sup>26–30.

**It is not possible to speak the truth:** Compare  $\Gamma$  7–8 1012<sup>a</sup>24–<sup>b</sup>18.

## Note 1204

K 7: Compare E 1.

## Note 1205

**In the case of productive science the starting-point of movement is in the producer and not in the product:** See Z 7 1032<sup>a</sup>27–<sup>b</sup>2.

## Note 1206

**In practical science too the movement is not in the action done but in the doer of the action:** See  $\Theta$  8 1050<sup>a</sup>34–<sup>b</sup>3.

## Note 1207

**The account of the snub is said of something together with the matter of the thing, whereas that of the concave is said separate from the matter:** Compare E 1 1025<sup>b</sup>34–1026<sup>a</sup>5.

## Note 1208

**If indeed there is some substance of that sort (I mean separable and immovable), which is just what we shall try to show:** In A 6–7.

## Note 1209

**This would be the primary and most controlling starting-point:** See A 1 981<sup>b</sup>11n.

## Note 1210

**There are three kinds of theoretical sciences—natural, mathematical, and theological:** Referred to as theoretical philosophies at E 1 1026<sup>a</sup>18–19.

Note 1211

**Theological science is concerned with the most estimable of beings, and each science is said to be better or worse in accord with the scientifically knowable object that properly belongs to it:** Compare A 2 982<sup>b</sup>28–983<sup>a</sup>11.

Note 1212

**We might raise a puzzle, however, as to whether or not the science of being qua being should be posited as universal at all (*pote*):** See E 1 1026<sup>a</sup>23–25, where the science is referred to as “primary philosophy.”

Note 1213

**Universal mathematics is common, concerned with all alike:** See E 1 1026<sup>a</sup>27n.

Note 1214

**Building does not investigate what coincidentally happens to those who will use the house (for example, whether they will live painfully in it or in the contrary way), and weaving, or shoemaking, or gourmet cooking does not [investigate such things] either:** The presupposition, as at E 2 1026<sup>b</sup>37–1027<sup>a</sup>8, is that it is not the intrinsic end of building and these other crafts to produce pain or pleasure. For pain and pleasure are determined in part by the states of the people who live in the houses, wear the clothes or shoes, and eat the food. And over these states the builder, weaver, shoemaker, and gourmet cook have no control.

Note 1215

**And as for the argument that when the person who is musical becomes grammatical:** Reading [οὐδὲ μουσικὸν καὶ γραμματικόν], οὐδὲ τὸν ὄντα μουσικὸν ὅτι γενόμενος γραμματικὸς with Ross. The argument given here is a case of the fallacy of combination (SE 4 166<sup>a</sup>23–32), which from “X came to be at the same time A and B” illicitly infers “X at the same time came to be A and came to be B.” The parallel argument at E 2 1026<sup>b</sup>15–21 is somewhat different.

Note 1216

**Plato was not wrong when he used to say that the sophist spends his time on what is not:** See E 2 1026<sup>b</sup>14–15n, 21–24.

Note 1217

**That it is not even possible for there to be a science of the coincidental will be evident if we try to see what the coincidental really is:** Compare E 2 1026<sup>b</sup>24–1027<sup>a</sup>28.

Note 1218

**That there are not causes and starting-points of the coincidental of the same sort as there are of the intrinsic is clear:** Compare E 3 1027<sup>a</sup>29–<sup>b</sup>16.

Note 1219

**As for being as being true:** Compare E 4.



**Which is why the starting-points of this way of being are not inquired about, but about being that is external (*exô*) and separable:** *Exô* seems to mean “external to thought or to the mind,” here, which is what it means at *DA* II 5 417<sup>b</sup>20: “in perception the things that are capable of producing the activity are external (*exôthen*).” In the parallel passage of *E* 4 (1028<sup>a</sup>2), however, this cannot be its meaning. For what is said there is that neither (1) being in the sense of being true nor (2) *coincidental being* makes clear “any nature of being as external,” and coincidental being is as much outside the mind as any other sort. Instead, what is meant is that (1) and (2) do not introduce new beings, or new ways in which things are said to be, that are “external,” in the sense of being outside the already established categories of beings. In a way, then, the two passages, though expressing different thoughts, come to much the same thing. For when we have found the starting-points and causes for the various categories of beings that are outside our minds, we do not need new or further ones for the perceptions and thoughts of these beings, since perception and thought are caused and explained by the beings that activate them (*DA* II 4 415<sup>a</sup>16–22, quoted in *I* 5 1010<sup>b</sup>35–37n).

#### Note 1220

**The for-the-sake-of is found in things that come about by nature or as a result of thought:** Compare *Ph.* II 5 196<sup>b</sup>21–25.

#### Note 1221

**Luck is a coincidental cause in things that in accord with deliberate choice come about for the sake of an end:** Compare *Ph.* II 5 197<sup>a</sup>5–14.

**Luck and deliberate choice are concerned with the same things:** “Luck and the results of luck are found in things that are capable of being lucky, and, in general, of action. That is why, indeed, luck is concerned with things doable in action” (*Ph.* II 6 197<sup>b</sup>1–2).

**Deliberate choice does not exist separate from thought:** See *NE* VI 2 1139<sup>a</sup>35–<sup>b</sup>5, quoted in *A* I 1013<sup>a</sup>20–21n.

#### Note 1222

**The causes, though, from which things due to luck might come about are indefinite:** Compare *Ph.* II 5 197<sup>a</sup>5–14.

#### Note 1223

**It is good or bad luck when the result is good or bad:** Compare *Ph.* II 5 197<sup>a</sup>25–27.

#### Note 1224

**Since nothing coincidental is prior to the intrinsic, coincidental cause are not either:** Compare *Ph.* II 6 198<sup>a</sup>5–13.

#### Note 1225

**If, then, luck or chance is a cause of the heaven:** On the distinction between luck and chance, which is introduced unheralded here, see *Ph.* II 5 196<sup>a</sup>24–35, *Z* 7 1032<sup>a</sup>29n.

**The heaven:** See A 5 986<sup>a</sup>3n.

Note 1226

**Some things are [1] actively only, [2] some potentially, [3] some potentially and actively:** Compare *Ph.* III 1 200<sup>b</sup>26–28. [1] Substantial form (© 8 1050<sup>b</sup>1–2). [2] The unlimited and the void (1048<sup>b</sup>9–17). [3] Matter-form compounds.

Note 1227

**There are as many kinds (*eidōs*) of movement and change as there are of being:** Compare *Ph.* III 1 201<sup>a</sup>8–9. More correctly there is change (*metabolē*) with respect to just four categories (substance, quality, quantity, place) and movement (*kinēsis*) with rest to just three (quality, quantity, place). See K 12 1068<sup>a</sup>8–16, A 2 984<sup>a</sup>34–<sup>b</sup>1n.

Note 1228

**Since there is a division in each kind (*genos*):** *Genos* = category here.  
**Between what is potential and what is actual (*entelecheia*[i]), the activation (*energeia*) of what is potential insofar as it is such is what I say movement is:** Compare *Ph.* III 1 201<sup>b</sup>4–5. On the relationship between *entelecheia* and *energeia*, see H 2 1042<sup>b</sup>8–11n.

Note 1229

**Movement exists when the actuality itself does, and neither earlier nor later:** Compare *Ph.* III 1 201<sup>b</sup>6–7.

Note 1230

**Being for bronze is not the same as being for a certain potential:** The being for A = the essence of A (Z 4 1029<sup>b</sup>13–1030<sup>b</sup>13).

Note 1231

**The underlying subject, though, whether it is healthy or diseased, whether it is moisture or blood, is one and the same:** According to the Hippocratic author of *On Ancient Medicine*, for example, the human body contains a blend (*chrēsis*) of moist substances or humors (*chumoi*), each with a capacity (*dunamis*) to cause a specific effect: “These, when mixed and blended with one another are neither manifest nor cause the human being pain; but when one of them separates off and comes to be on its own, then it is both manifest and causes the human being pain” (14.4 Schiefsky). Plato adopts a somewhat similar view, with imbalances in the blood playing an important role in causing certain diseases (*Ti.* 81e–86a).

Note 1232

**Some say that movement is otherness (*heterotēta*) or inequality (*anisotēta*) or not being:** “Let us always posit movement as non-uniformity. And the cause again of what is non-uniform in nature is inequality (*anisotēs*)” (Plato, *Ti.* 57e7–58a1).

Note 1233

**The starting-points in one of the two columns of opposites, because they are lacks, are indefinite:** See A 7 1072<sup>a</sup>31, and A 5 986<sup>a</sup>23n.

## Note 1234

**The cause of a movement's being an incomplete activity is that the potentiality of which it is the activation is incomplete:** Compare *Ph.* III 2 201<sup>b</sup>31–33.

## Note 1235

**That movement is in the moveable is clear:** Compare *Ph.* III 3 202<sup>a</sup>13–21.

## Note 1236

**The unlimited is either what cannot be traversed because it is not of a nature to be traversed:** Compare *Ph.* III 4 204<sup>a</sup>3–14. On the various meanings of “un-” (*alpha* privative in Greek), see  $\Delta$  22 1022<sup>b</sup>32–1023<sup>a</sup>5.

## Note 1237

**How is it possible for the unlimited to intrinsically exist, if number and magnitude, of which the unlimited is an attribute, do not?:** Compare *Ph.* III 5 204<sup>a</sup>17–19.

## Note 1238

**If the unlimited is a coincident, it cannot—insofar as it is unlimited—be an element of the beings:** Compare *Ph.* III 5 204<sup>a</sup>14–17.

## Note 1239

**It is clear that it is not possible for the unlimited to be actively so:** Compare *Ph.* III 5 204<sup>a</sup>20–32.

## Note 1240

**Being for the unlimited and the unlimited are the same, if indeed the unlimited is substance and not an attribute of an underlying subject:** See *Z* 11 1037<sup>a</sup>33–<sup>b</sup>3.

## Note 1241

**It cannot be the unlimited that is a starting-point, but rather that thing with which it is coincident, namely, the air or the even:** The air, Anaximenes (*A* 3 984<sup>a</sup>5); the even, the Pythagoreans (*5* 986<sup>a</sup>15–20n).

## Note 1242

**The unlimited is not found in perceptible things:** Compare *Ph.* III 5 204<sup>a</sup>34–<sup>b</sup>8. **The preceding inquiry is universal** (*katholou*): What is described as inquiring *katholou* here is described as *logikôs* (“logico-linguistic”) at *Ph.* III 5 204<sup>b</sup>4, and so is contrasted with inquiring *phusikôs* at 1066<sup>b</sup>26 (= 204<sup>b</sup>10). The contrast is discussed in *Z* 4 1029<sup>b</sup>13n(3).

## Note 1243

**In the context of natural science** (*phusikôs*), **it is clear that there cannot be an unlimited body:** Compare *Ph.* III 5 204<sup>b</sup>10–24.

## Note 1244

**The elements are limited in multiplicity:** “There cannot be one of a pair of contraries [= the elements], nor can the contraries be unlimited in number, because if they are there will be no scientific knowledge of the beings; and there is only one contrariety in any one genus, and the substance is one genus; and since it is

possible for things to be composed of a limited number, it is better for them to be composed of a limited one . . . than from an unlimited one" (*Ph.* I 6 189<sup>a</sup>12–16).

Note 1245

**If one of the two bodies falls in any way short of the other in capacity (*dunamis*), the limited will be destroyed by the unlimited:** Suppose A is an unlimited body of fire and B a limited body of air, then provided the *dunamis* ("capacity," "power") of a portion of fire exceeds that of an equal portion of air in some finite ratio, B will be destroyed by A (*Ph.* III 5 204<sup>b</sup>14–19).

Note 1246

**Nor can the unlimited body be one and simple:** Compare *Ph.* III 5 204<sup>b</sup>32–205<sup>a</sup>7. **One (*hen*) and simple (*haploun*):** An unlimited body must be divisible (1066<sup>b</sup>4–5) and so must have parts. Hence it cannot be simple in the sense of incomposite or without parts (*Cael.* II 4 286<sup>b</sup>17). Instead it seems to be something closer to uniform (*homoeidēs*) (1067<sup>a</sup>9) or homogeneous (*suggenēs*) (1067<sup>a</sup>12). That is why the argument given against the simplicity of the unlimited body at 1067<sup>a</sup>2–7 hinges on showing that the universe cannot be fire or some one other of the elements. If it could, the universe would be uniform or homogeneous but not incomposite or without parts. On the distinction between *hen* and *haploun*, see A 7 1072<sup>a</sup>33. **Whether, as some people say, it is something beyond the elements, out of which they generate these:** The reference is to Anaximander (*Jota* 1 1052<sup>b</sup>10–11n).

Note 1247

**The universe (*to hapan*), even if it is limited, cannot be or become any one of them:** The reason is apparently the one given at 1067<sup>a</sup>6, namely, that everything changes from contrary to contrary. On *to hapan*, see A 1 1069<sup>a</sup>19n.

**As Heraclitus says all things at times become fire:** DK B30, B64, B66, B90 = TEGP 47 F28, 56 F34, 120 F76, 55 F33.

Note 1248

**The same argument applies also to the one that the physicists put beyond the elements:** The argument (1066<sup>b</sup>35–1067<sup>a</sup>1) that applies to one of the four elements (fire, in the case of Heraclitus) applies also to the one that (for example, Anaximander) puts beyond them.

Note 1249

**A perceptible body is somewhere:** Compare *Ph.* III 5 205<sup>a</sup>10–25.

**The [proper] place of whole and of part is the same:** In the case of sublunary animals, up and down, front and back, right and left are not just spatially or relationally distinguished but functionally and absolutely so: "the part from which the distribution of nourishment and growth derives in each living thing is up and the last part toward which this travels is down—the one is a sort of starting-point, the other a limit; and up is a starting-point" (*IA* 2 705<sup>a</sup>32–<sup>b</sup>2). Similarly, the front is a starting-point, because it is where the perceptual organs are located (4 705<sup>b</sup>10–13). Even in earthworms, where right and left are more difficult to distinguish perceptually, the functional difference between them still exists: "the starting-point

of the movement is the same in all animals and by nature has its position in the same place; and it is from the right that the starting-point of movement derives" (5 706<sup>a</sup>10–13). Thus human beings put their left foot forward, unless they accidentally do the opposite, since "they are moved not by the foot they put in front, but by the one with which they step off" (5 706<sup>a</sup>8–9). In the case of the sphere of the fixed stars, the same applies not just to right and left but to all six functionally defined directions: "We should not be puzzled, because the shape of the universe is spherical, about how there will be a left and a right of it when all its parts are similar and all the time moving. We should instead understand it as being just like a thing in which there is a difference between right and left, and other shape-related aspects, about which a sphere has then been placed, since it will possess the difference in function, but will seem not to, because of the uniformity of the shape. It is the same way with the starting-point of movement. For even if it never began moving, all the same it must have a starting-point from which it would have begun if it had begun moving, and, if it were to come to a stop, from which it would start moving again" (*Cael.* II 2 285<sup>a</sup>31–<sup>b</sup>8). It is these functionally defined directions that determine unconditional or absolute locations or places in the universe. The place that is unconditionally up, for example, as opposed to being up relative to something else, is at the periphery of the sphere of the fixed stars; the one that is unconditionally down is at its center (IV 2 308<sup>a</sup>17–29). It is absolute places, in turn, that figure in the essential definitions of the five elements, making them the closest analogue of form that these elements possess (*Ph.* VIII 4 255<sup>b</sup>13–17). Thus earth, for example, is what is unconditionally heavy, since unless it is opposed, it naturally moves toward the place at the center. The center of the universe, therefore, is its proper place—the place where it would be unless something else prevented it. It is in this sense of place, then, that a part of earth has the same place as that of earth as a whole.

#### Note 1250

[2b] **If the unlimited body is uniform** (*homoeides*): [2b] is an additional argument against [2] the existence of a simple (*haplous*) unlimited body, because the relevant sort of simplicity is uniformity (1066<sup>b</sup>34n).

**It will be immovable or will always be moving:** The idea is perhaps this. If the whole is uniform or homogeneous, each sub-place of its proper place is equally proper to each of its parts. So either none will move naturally from whichever sub-place it happens to be in, or, if it is moving, it will never stop, since it would stop and be at rest only in its distinctive proper sub-place—which *ex hypothesi* it does not have.

**But this is impossible. For why down rather than up or than anywhere else?:** What is impossible is that it should rest in a place proper to it that is absolutely down (the proper place of earth) or up or anywhere else, or that it should move toward that place.

#### Note 1251

**The body of the universe will not be one except by contact:** And so will not be intrinsically one, see  $\Delta$  6 1016<sup>a</sup>7, and, on the significance of the issue,  $\Lambda$  1 1069<sup>a</sup>19n.

Note 1252

**Limited in kind the parts cannot be, since then those of one kind will be unlimited and those of another will not (if the universe is unlimited):** If the universe has parts of kinds  $K_1 \dots K_n$  (where  $n$  is finite), then for *some*  $K_i$  the parts of  $K_i$  must be unlimited. But they cannot all be unlimited (1066<sup>b</sup>31–34). Hence  $K_i$  will destroy the other kinds, since these are contraries (1066<sup>b</sup>29–31).

Note 1253

**If the parts are unlimited and simple, their proper places are also unlimited:** Compare *Ph.* III 5 205<sup>a</sup>10–25. The assumption is that parts of different kinds must have different proper places, since it is these that determine their kinds or forms. **And there will be an unlimited number of elements:** Which is impossible (1066<sup>b</sup>28).

Note 1254

**The places are limited:** See 1067<sup>a</sup>29<sub>n</sub>.

Note 1255

**There cannot be an unlimited body and also a [proper] place for bodies, if every perceptible body has either weight or lightness:** Compare *Ph.* III 5 205<sup>b</sup>24–206<sup>a</sup>7.

Note 1256

**There are six kinds of place:** The six unconditional or absolute locations or places (up, down, left, right, front, back) are those determined by the six functionally defined directions. See 1067<sup>a</sup>8<sub>n</sub>.

**These cannot exist in an unlimited body:** Because the body cannot move to any of them (1067<sup>a</sup>9–10).

Note 1257

**What is in a place is somewhere, and this signifies either up or down or in one of the other directions, and each of these is a sort of limit:** Just as the limit of up (or the uppermost place) is the periphery of the sphere of the fixed stars (1067<sup>a</sup>8<sub>n</sub>).

Note 1258

**The unlimited is not the same thing in magnitude, in movement, and in time by way of being some one nature:** Compare *Ph.* III 7 207<sup>b</sup>21–25.

**By way of being some one nature:** See Γ 1.

Note 1259

**Something that changes either changes coincidentally or is unconditionally said to change:** Compare *Ph.* V 1 224<sup>a</sup>21–<sup>b</sup>1.

**There is something that is itself moved directly (*prôton*):** *Prôton* also means “first” or “primary.”

Note 1260

**The forms, though, and the attributes and the places, to which moving things are moved, are immovable:** Compare *Ph.* V 1 224<sup>b</sup>11–16.

**Scientific knowledge:** *Ph.* VII 3 247<sup>b</sup>1–13 (quoted in *A* 9 1075<sup>a</sup>7–9n) explains why scientific knowledge is not a movement but the terminus of one.

#### Note 1261

**Change that is not coincidental is not found in all things but only in contraries, intermediates, and in contradictories:** Compare *Ph.* V 1 224<sup>b</sup>28–30.

#### Note 1262

**I mean by “underlying subject” what is made clear by an affirmation:** See 1068<sup>a</sup>6–7n.

**Something that changes, changes from an underlying subject to an underlying subject:** Compare *Ph.* V 1 225<sup>a</sup>3–226<sup>a</sup>16.

#### Note 1263

**A change from what is not an underlying subject to an underlying subject, the relation being that of contradiction, is coming to be—unconditional coming to be when the change is unconditional, in a particular respect when the change is in a particular respect:** “For example, a change from not white to white is a coming to be in this respect, namely, white, whereas a change from unconditional not being to substance is unconditional coming to be” (*Ph.* V 1 225<sup>a</sup>14–16).

#### Note 1264

**What is not by combination or by division** (*to kata sunthesin ê diairesin*): What is not *to kata sunthesin ê diairesin* is *to mê on to hôs pseudos* (*E* 4 1026<sup>a</sup>35), which is what is not in the sense of what is not true, or what is false (also *A* 7 1017<sup>a</sup>31, *Q* 10 1051<sup>b</sup>1, *N* 2 1089<sup>a</sup>28). What is not by combination is an untrue affirmative; what is not by division is an untrue negative.

**Does not admit of movement:** “A substance, however, numerically one and the same, is receptive of contraries. For example, the particular human—one and the same one—becomes pale at one time and dark at another, and hot and cold, and bad and excellent. Nothing like this is evident in the case of other things, unless someone might object and say that a statement (*logos*) or a belief is like this. For the same account seems to be both true and false—for example, suppose that the statement that someone is sitting is true; after he has got up this same statement will be false. The same way with beliefs. For suppose that you believe truly that someone is sitting; after he has got up you will believe falsely if you hold the same belief about him. But even if we were to grant this, there will still be a difference in the way [they are receptive of contraries]. For in the case of substances it is by themselves changing that they are receptive of contraries. For what has become cold instead of hot, dark instead of pale, or excellent instead of bad, has changed (altered, indeed). Similarly, in other cases, too, it is by undergoing change that each is receptive of contraries. Statements and beliefs, by contrast, themselves remain entirely immovable—it is because of the movement of the thing that the contrary comes to belong to them. For the statement that someone is sitting remains the same; it is because of the movement of the thing that it comes to be true at one time and false at another. Similarly, in the case of beliefs. Hence the way, at any rate, in which it is receptive of contraries, namely, because

of a change in itself, would be special to substances, even if we were to grant that beliefs and statements are able to receive contraries" (*Cat.* 5 4<sup>17</sup>–<sup>b3</sup>).

**What potentially is not and is opposed to what unconditionally is:** What unconditionally is, is a substance and a this (1067<sup>b23n</sup>). What is opposed to it is what is unconditionally not a substance (1067<sup>b29</sup>).

#### Note 1265

**The underlying subjects . . . are made clear by an affirmation—for example, the naked, toothless, or black:** In other words, to say what toothless is we refer to the affirmation (or positive notion) of having teeth, since toothless = lack of teeth. Similarly, naked = lack of clothes, and black = the lack of white (A 4 1070<sup>b18–21</sup>).

#### Note 1266

**If the categories are distinguished as substance, quality, place, acting or being acted upon, relation, quantity:** See A 981<sup>a3</sup>(7).

#### Note 1267

**There is no movement with respect to substance:** Substances come to be and pass away, but these changes are not movements (K 11 1067<sup>b30–1068<sup>a1</sup></sup>).

**There is no movement of relation (for when one of the relata changes it may not be true that the other changes at all, so that the movement of them is coincidental):** Suppose that the relation is equality in height (=), and that the relata are A and B. At  $t_1$   $A = B$ , at  $t_2$   $A \neq B$ , not because A has changed but because B has grown. The real or intrinsic change, which is one of quantity, is in B not in the pair A, B, whose movement is coincidental, since that of A is coincidental.

#### Note 1268

**Some other underlying subject might change from one change to some other kind—for example, the human from sickness to health (*ek nosou eis hugieian*):** For the example to be of an underlying subject (the human) changing from one change to another kind, *nosos* must be understood as “becoming sick” and *hugieia* as “becoming healthy,” as 1068<sup>a26</sup> shows.

#### Note 1269

**Coming to be and passing away are also from something to something, except that these are to things opposed in one way, whereas the other—movement—is to things opposed in another way:** Movement is change from one contrary to another; coming to be and passing away are from one contradictory to another (K 11 1067<sup>b21–25</sup>).

#### Note 1270

**It is clear, then, that if it has become sick, it will have changed to whatever the other sort of change may be (but indeed it may remain at rest):** The parenthetical remark acknowledges that—as 1068<sup>b7</sup> implies—there may be a moment of rest between becoming sick and becoming healthy, when one simply *is* sick.



## Note 1271

**What simply comes to be something was not yet there, but there was already something that was coming to be coming to be something:**  $B_s$  is a simple coming to be.  $B_c$  is a non-simple or complex coming to be—one that is coming to be something that might itself be coming to be. If at time  $t$   $B_s$  is coming to be, then  $B_c$  is also coming to be at  $t$ . For something must be becoming  $B_s$  at  $t$ , and that something must, therefore, be a non-simple coming to be, namely,  $B_{c,1}$ . But  $B_{c,1}$  was also coming to be at  $t$ , so there must be a  $B_{c,2}$  that was coming to be  $B_{c,1}$ . And so on.

## Note 1272

**Since there is no movement either of substance or of relation or of agent and acted upon, it remains for movement to be with respect to quality, quantity, and place:** Compare *Ph.* V 2 226<sup>a</sup>23–29.

## Note 1273

**The immovable:** Compare *Ph.* V 2 226<sup>b</sup>10–16.

## Note 1274

**TOGETHER IN PLACE:** Compare *Ph.* V 3 226<sup>b</sup>21–25.

**One primary place:** “Some things are said to be [what they are] intrinsically, some with reference to another thing, and place may be wither the common place, in which all bodies are, or the special place that is the primary one in which a body is. I mean, for example, that you are now in the heaven because you are in the air and it is in the heavens, and you are in the air because you are on the earth and, similarly, in that one because you are in this place, which surrounds nothing more than you” (*Ph.* IV 2 209<sup>a</sup>31–<sup>b</sup>1).

## Note 1275

**CONTRARY IN PLACE is what are most distant in a straight line:** Compare *Ph.* V 3 226<sup>b</sup>32–227<sup>a</sup>31.

## Note 1276

**Since all change is between opposites . . . :** This sentence should probably follow the one in which *INTERMEDIATE* is defined.

## Note 1277

**It is clear that the successive is primary:** Contact (*haptomenon*) and succession (*hexê*s) are initially defined independently (1068<sup>b</sup>27, 31–33), with contiguous (*echomenon*) defined in terms of them: contiguous = successive + in contact (1069<sup>a</sup>1–2). So, for example, two successive numbers are not continuous because they are not in contact, or do not touch. A hand and a glove that is on it are not continuous because, though they touch, they are not of the same kind. Two successive houses that make contact are contiguous. In establishing the primacy of succession, however, Aristotle claims that things that are successive need not make contact, whereas things that make contact must be successive. It seems to follow that contiguous and contact are the same thing. This might seem to be presupposed

or implied, in any case, by the fact that continuity is both a sort of contiguity (1069<sup>a</sup>5) and a sort of contact (1069<sup>a</sup>10). 1069<sup>a</sup>1–2 aside, indeed, no text distinguishes contiguity from contact.

# Note 1278

**A point is not the same as a unit, since in points there is contact:** A point is what has position and is indivisible in all dimensions ( $\Delta$  6 1016<sup>b</sup>25–26). A place is “the primary thing surrounding each body” (*Ph.* IV 2 209<sup>b</sup>1–2), and the “extremes” of a body are its surface envelope. Apparently, then, a point has neither place nor extremes, and so it is unclear, given the definition of touch at 1069<sup>b</sup>27, that points can make contact. Perhaps the idea is that points make contact when the non-continuous bodies they belong to make contact at them.

## BOOK LAMBDA (XII)

# Note 1279

**The theoretical knowledge (*theôria*):** Namely, the theoretical knowledge of being qua being.

# Note 1280

**If the universe (*to pan*):** In the *Metaphysics* *to pan* consistently refers not to the totality of things, but to the ones that make up the spatio-temporal universe. At A 2 982<sup>b</sup>17 *to pan* is something that comes to be; at A 3 984<sup>b</sup>2 it is *nature* as a whole (984<sup>a</sup>31; compare A 8 1074<sup>b</sup>3, 10 1075<sup>a</sup>11); at A 4 984<sup>b</sup>26, 985<sup>a</sup>25 it is something that comes to be and gets divided into the various elements by strife; at A 5 986<sup>b</sup>10–11, 17 and 8 988<sup>b</sup>22 it is material and corporeal; at K 10 1067<sup>a</sup>3, 15, 16, 19, 22, *to pan* is again something that has material body. That is why, for example, Aristotle can claim that everything (= everything that is a part of the universe) has matter and a moving cause (A 5 1071<sup>a</sup>33–34)—something that is manifestly false of all substances (6 1071<sup>b</sup>20–21).

**Is a whole of some sort (*holon ti*):** At Iota 1 1052<sup>a</sup>22 a whole is what has a certain shape and form by nature, and at  $\Delta$  6 1016<sup>b</sup>12–13 not being “some sort of whole (*ti holon*)” is identified with “not possessing one form.” At H 6 1045<sup>a</sup>10 a whole is something beyond the parts, which is the cause of their being one, namely, a form (1045<sup>a</sup>23). And at M 8 1084<sup>b</sup>30, whole goes together with one and form. Notice “the substance [= form, essence] of the universe” at 1076<sup>a</sup>1.

**And if it exists by being a succession (*tô[i] ephexês*):** A view like that of Speusippus, described in Z 2 1028<sup>b</sup>20–27 and at A 10 1075<sup>b</sup>34–1076<sup>a</sup>4.

**A succession:** See K 12 1068<sup>b</sup>31–1069<sup>a</sup>1.

**Substance is primary, then quality, then quantity:** Compare M 8 1083<sup>a</sup>10–11.

# Note 1281

**But qualities and movements:** Reading ἀλλὰ ποιότητες καὶ κινήσεις with Ross for OCT οἷον ποιότητες καὶ κινήσεις (“for example, qualities and movements”).

**At any rate we say that even the not white and the not straight also are—for example, that something is not white:** See  $\Delta$  7 1017<sup>a</sup>18–19, Z 4 1030<sup>a</sup>25–26.

## Note 1282

**None of the others is separable:** See Z 1 1028<sup>a</sup>33–34n.

## Note 1283

**The early philosophers also in effect (*ergô[i]*) testify to this, since they were inquiring into the starting-points, elements, and causes of substance:** The force of *ergô[i]* is to make clear that the early philosophers did not explicitly conceive of what they were doing in terms of a worked out notion of substance (A 7 988<sup>a</sup>34–35, 10 993<sup>a</sup>11–24).

## Note 1284

**Present-day thinkers:** Platonists.

**For the genera are universal, and these they say are starting-points and substances to a higher degree:** See Z 14 1039<sup>a</sup>24–26.

**Because they inquire in a logico-linguistic way:** See Z 4 1029<sup>b</sup>13n.

## Note 1285

**Not what is common to both, namely, [being a] body:** That is, the universal common to all bodies. No particular body is common to fire, earth, and the others (GC I 5 320<sup>b</sup>23).

## Note 1286

**One is perceptible, which was agreed upon by all, of which one sort is capable of passing away, such as plants and animals, and the other sort eternal:** Reading μία μὲν αἰσθητή, ἣν πάντες ὁμολογοῦσιν, ἥς ἡ μὲν φθαρτή, οἷον τὰ φυτὰ καὶ τὰ ζῶα, ἡ δ' αἰδῖος for OCT μία μὲν αἰσθητή—ἥς ἡ μὲν αἰδῖος ἡ δὲ φθαρτή, ἣν πάντες ὁμολογοῦσιν, οἷον τὰ φυτὰ καὶ τὰ ζῶα (“One is perceptible—of which one sort is eternal and the other capable of passing away, which was agreed upon by all, such as the plants and the animals”).

## Note 1287

**Another sort of substance is immovable, and this [3a] certain thinkers say is separable, some dividing it into two, the Forms and the objects of mathematics, [3b] others positing these two as one in nature, and [3c] others only one of these, namely, the objects of mathematics:** [3a] Plato (Z 2 1028<sup>b</sup>19–20); [3b] Xenocrates (1028<sup>b</sup>24–27n); [3c] Speusippus (1028<sup>b</sup>21–24, M 1 1076<sup>a</sup>20–21).

## Note 1288

**The first two sorts belong to natural science (for they involve movement), the third to another science, if no starting-point is common to these:** The meaning is presumably that if there is no starting-point common to [3] immovable substances and [1] perceptible ones capable of passing away or [2] eternal, then natural science (*phusiké*) will deal with [1] and [2], and another science will deal with [3]. But if there is a starting-point common to both, as Aristotle has suggested there is (E 1 1026<sup>a</sup>27–31), then a single science (= primary philosophy) will deal with [3] and with [1] and [2], while natural science will deal with [1] and [2] exclusively. Puzzles associated with the existence of such a universal science are described at B 4 1000<sup>a</sup>5–1001<sup>a</sup>3 (= [P10], K 2 1060<sup>a</sup>27–36 (= [P11])).

Note 1289

**If change is from opposites or from intermediates:** See K 11 1067<sup>b</sup>12–1068<sup>a</sup>7.

Note 1290

**A 2:** The chapter break interrupts what is clearly a continuous argument.

Note 1291

**Changes are with respect to the [this] something (to ti):** *To ti* (“the something”) is equivalent in meaning to *to tode* (“the this”), which is substituted for it at 1069<sup>b</sup>11.

**Unconditional coming to be and passing away:** See H 2 1042<sup>b</sup>7n.

**With respect to the this:** Reading *κατὰ τὸ τὸδε* with Ross for OCT *κατὰ τὸδε* (“with respect to this”).

Note 1292

**It must, then, be the matter, since it is capable of both states, that changes:** “Matter in the strict sense is most of all the underlying subject that is receptive of coming to be and passing away, but the underlying subject of the other changes is also in a way matter, because all these underlying subjects are receptive of contraries of some sort” (GC I 4 320<sup>a</sup>2–5).

Note 1293

**This (tout’)** is the one of Anaxagoras: The thought expressed in the whole sentence is roughly speaking this: “What the first philosopher feared most of all . . . [was] the coming to be of something from nothing preexisting” (GC I 3 317<sup>b</sup>29–31). So they came up with various ways to avoid having to assume this. One was the primordial mixture of Anaxagoras in which all the things that come to be were already present, another the “mixture” of Empedocles and Anaximander, another Democritus’ candidate. A better resolution to the problem, however, is the view expressed in the previous sentence (to which *tout’* refers), namely, that what is comes to be from what actively or actually is not, but is potentially. Insofar as their views were precursors of this one, these thinkers were latching on to matter.

**The one of Anaxagoras:** A 8 989<sup>b</sup>14–17 claims that Anaxagoras must say that *nous* (divine understanding) is the one (compare 1069<sup>b</sup>31 below), since it alone is simple and unmixed. But there is no suggestion that Anaxagoras himself referred to *nous* in this way; Aristotle is quite explicit about this (A 8 989<sup>a</sup>30–33). It is probably the case that here too, indeed, Aristotle is not using Anaxagoras’ terminology, but his own. For Anaxagoras’ primordial mixture, as something homoeomerous throughout, is also a mixture (*mixis*) in Aristotle’s own technical sense of the term, which requires that all the ingredients fuse to form *one* thing (989<sup>a</sup>33–<sup>b</sup>4n). Since that primordial mixture is the initial stage, “the All,” on which Aristotle is now focusing, can be correctly characterized as *the* one. Similar considerations apply to the characterization of Anaximander’s “unlimited” as a *mixis* (1069<sup>b</sup>22).

**“All things were together”:** DK 59 B1 = TEGP 11 F1—also quoted and discussed at Iota 6 1056<sup>b</sup>28–30.

**The “mixture” of Empedocles:** See A 3 984<sup>a</sup>8–11, 5 985<sup>a</sup>21–29, 8 989<sup>a</sup>20–26.

**And Anaximander:** DK B1 = TEGP F1, Iota 1 1052<sup>b</sup>10–11n.

What Democritus says, namely, “all things were together”—potentially, yes, but not actively: Reading καὶ ὡς Δημόκριτός φησιν “ἦν \*\*\* πάντα”—δυνάμει γ’, ἐνεργείᾳ δ’ οὐ for ΟCΓ καὶ ὡς Δημόκριτός φησιν—ἦν μὲν πάντα δυνάμει, ἐνεργείᾳ δ’ οὐ. Ross reads ὡς Δημόκριτός φησιν—ἦν ὁμοῦ πάντα δυνάμει, ἐνεργείᾳ δ’ οὐ. I take “ἦν \*\*\* πάντα” as reporting some saying of Democritus to the effect that there is no genuine coming to be (A 4 985<sup>b</sup>4–20, Γ 5 1009<sup>a</sup>26–30), and δυνάμει γ’, ἐνεργείᾳ δ’ οὐ as Aristotle’s comment on it.

Note 1294

All things that change have matter, but distinct sorts: See H 1 1042<sup>b</sup>5–6n.

Note 1295

Not being is trifold: See K 11 1067<sup>b</sup>25–1068<sup>a</sup>7.

Note 1296

Neither the matter nor the form comes to be—I mean the ultimate ones (*ta eschata*): The ultimate matter at Z 10 1035<sup>b</sup>30, as at H 6 1045<sup>b</sup>18, is the so-called proximate matter—the matter in which the relevant form is first present—this is referred to as *teleutaia hulê* (“final matter”) at 1070<sup>a</sup>20. What Aristotle means here, however, is not the proximate matter in that sense, but the one that must already be there when a process of production or coming to be begins (Z 8 1033<sup>a</sup>24–<sup>b</sup>5).

Note 1297

That as a result of which is the direct (*prôton*) mover: *Prôton* also means “first” or “primary,” but here refers not to the first mover in a chain of causes but to the last one—the one that causes the change without the help of any intervening mover.

Note 1298

Things come to be either by craft, by nature, by luck or by chance: Compare Z 7 and, on the contrast between luck and chance, see 1032<sup>a</sup>28–30n.

Note 1299

Human begets human: See Z 9 1034<sup>a</sup>34–<sup>b</sup>4.

The remaining causes are lacks of these: The causes in question are luck and chance.

Note 1300

There are, though, three sorts of substances: Compare Z 3 1029<sup>a</sup>2–7.

The matter, which is a this something [merely] in appearance (*hê men hulê tode ti ousa phainesthai*): The meaning, apparently (the Greek is awkward), is that the matter, especially when already organized into the thing it constitutes, looks like a particular thing, on the order of Callias and Socrates. See Z 10 1035<sup>a</sup>14n.

Whatever is by contact and not by a natural unity (*sumphusei*): See K 12 1069<sup>a</sup>5–12, and, on *sumphusei*, Z 16 1040<sup>b</sup>15n.

Is matter and underlying subject: See A 2 1069<sup>b</sup>14–15n.

For example, fire, flesh, head—for these are all matter, and the final matter is that of what is most of all substance: Following Ross, who follows Alexander, I have resituated 1070<sup>a</sup>19–20 (“for example, fire, flesh, head—for these are all

matter, and the final matter is that of what is most of all substance”) to follow “underlying subject” in 1070<sup>a</sup>11.

**The nature, which is a this something:** Nature here is form.

**And a certain state toward which:** The craftsman moves the matter of an artifact, as a nature moves a natural object, toward the actual possession of the form.

Note 1301

**The form of house is not something beyond the particular composite houses, unless as the craft of building:** The form of a house exists in the soul of the builder who has scientific knowledge of its account; similarly in the case of health and the products of other crafts (Z 7 1032<sup>a</sup>33–<sup>b</sup>6). That is why the craft of medicine is said to be the form of health (1070<sup>a</sup>29–30). See also H 3 1043<sup>b</sup>21–23.

**Nor is there coming to be or passing away of these, but instead it is in another way that there is or is not a house that is without matter, or health, or anything that is in accord with craft:** See Z 15 1039<sup>b</sup>20–27.

Note 1302

**Those that are causes in the way that the account (*logos*) is:** Another case in which *logos* is used in place of the form or essence that is its ontological correlate (Δ 6 1015<sup>b</sup>25n).

Note 1303

**The soul may be like this—not all soul, but rather the understanding:** See α 1 993<sup>b</sup>11n, E 1 1026<sup>a</sup>5n.

Note 1304

**The causes and starting-points of distinct things are distinct in a way, but in a way—if we are to speak universally and analogically—they are the same for all:** Compare E 11 1026<sup>a</sup>23–32, and, on analogical unity, see Δ 6 1016<sup>b</sup>31–1017<sup>a</sup>3.

Note 1305

**Beyond substance and the other categories of predicables there is nothing common:** Because the categories are the most universal predicables (or genera) that there are (Δ 7 1017<sup>a</sup>23n).

**An element is prior to the things of which it is an element:** And so will be common to things in different categories and, as prior to them, distinct from them. Hence the corresponding predicable (“is composed of the elements”) will be more universal than any of the categories, which is impossible.

Note 1306

**Nor, then, is any of the intelligible things an element:** For being and unity are predicated of all things, and no element is predicated of the things of which it is an element (N 1 1088<sup>b</sup>4–8).

Note 1307

**None of the elements will be either a substance or a relation—but this is necessary:** It is necessary because nothing can exist if it does not belong to some category. Substance and relation are stand-ins for categories generally (1070<sup>a</sup>34–35).

## Note 1308

**Presumably the elements of perceptible bodies are, as *form*, the hot and, in another way, the cold, which is the *lack*:** See Z 16 1040<sup>b</sup>5–10n.

## Note 1309

**There are three starting-points—the form and the lack and the matter. But each of these is distinct for each category:** See Z 4 1029<sup>b</sup>22–25, N 1 1089<sup>b</sup>27–28.

**In colors white, black:** See Δ 10 1018<sup>a</sup>24–25n.

**And surface:** See Δ 17 1022<sup>a</sup>16–17.

## Note 1310

**What is so in the sense of moving or causing rest is a sort of starting-point:** Reading τὸ δ' ὡς κινεῖν ἢ ἰστὴν ἀρχὴ τις καὶ οὐσα. OCT omits καὶ. Ross reads τὸ δ' ὡς κινεῖν ἢ ἰστὴν ἀρχὴ τις καὶ οὐσία (“what is so in the sense of moving or causing rest is a sort of starting-point and substance”). Nothing in the preceding argument justifies the conclusion that a moving cause is a substance, although Aristotle does think that it is one.

**The starting-point is divided into these two [sorts]:** Reading καὶ εἰς ταῦτα διαίρεται ἡ ἀρχὴ here rather than at 1070<sup>b</sup>24, and deleting it at 1070<sup>b</sup>30–31, where it is repeated in most mss. OCT brackets both occurrences for deletion.

## Note 1311

**Distinct things have distinct elements, causes, and starting-points, as was said:** At 1070<sup>b</sup>17.

**Direct cause:** *Prôton*, which also means “first,” is here used to mean “direct,” or “proximate.”

## Note 1312

**The moving cause in the case of natural things is for a human a human:** Reading τὸ κινεῖν ἐν μὲν τοῖς φυσικοῖς ἀνθρώπῳ ἀνθρώπος for OCT τὸ κινεῖν ἐν μὲν τοῖς φυσικοῖς τὸ ὁμοειδὲς οἷον ἀνθρώπῳ ἀνθρώπος (“the moving cause in the case of natural things is what is the same in form—for example, for a human a human”).

## Note 1313

**And, furthermore, beyond these there is what as the first of all [movers] moves all things:** Once we have introduced form, the lack, matter, and the moving cause, as analogical unities, we can see what <health, sickness, body, the craft of medicine> has in common with <form, disorder of such-and-such sort, bricks, the craft of building>, and with <a human begetting a human>. In each case we have a form (house, health, human form), a lack (sickness, disorder of such-and-such sort, the lack of human form), matter (body, bricks, flesh and bones), all of which are internal to the thing that comes to be, and an external moving cause (the craft of medicine, the craft of building, the father). If we lead back the craft to the form, the effect is to bring more clearly into view the analogy between craft production, where the moving cause is external, and natural reproduction, where it is internal and encoded in the form. Generalizing on these structures we get: <form, lack, matter, external moving cause>. Now ask the general question, why is form

(actuality, activity) of any sort present in the universe? By analogy with the particular cases there must be a first mover responsible for it. In one way, this must be external to and so beyond the universe, just as in the case of crafts. But in another way, if we lead back the external moving cause to an internal formal one, as in the case of natural beings, it will be internal to the universe. Compare *A* 5 1071<sup>a</sup>13–17, 10 1075<sup>a</sup>11–25.

#### Note 1314

**Some things are separable and others are not separable, the former are substances:** See *Z* 1 1028<sup>a</sup>33–34.

#### Note 1315

**These causes will presumably be soul and body, or understanding and desire and body:** In *A* 3 1070<sup>a</sup>5–6 Aristotle refers to both (1) natural things and (2) artifacts as substances. (1) The natural things are (1a) the animals and plants, (1b) their parts, (1c) the natural bodies (earth, water, fire, air), and (1d) the heaven and its parts, the stars, sun, and moon (*Z* 2 1028<sup>b</sup>8–13). *Z* 16 1040<sup>b</sup>5–10 excludes both (1b) and (1c) from being substances, so that only (1a) and (1d) remain (*Z* 17 1041<sup>b</sup>28–30). In the case of (1a) we can see right away why body and soul should be their causes, since all living things have souls and bodies of some sort, by reference to which their various movements (growth, spatial movement, alteration) are explained, while human beings have, in addition, an understanding, responsible together with desire for their deliberately chosen actions (*Z* 10 1035<sup>b</sup>14–22n). What makes these same factors responsible for the movements of the various celestial beings is that these beings too are in various ways like living things: “We think about the stars as bodies alone, that is, as unitary things that, although they have an order, are otherwise wholly inanimate, but we should posit them as having a share of action and life” (*Cael.* II 12 292<sup>a</sup>18–21). (2) Artifacts may not be substances, as *H* 3 1043<sup>b</sup>21–23 suggests, or not substances in the fullest sense. But whatever about that, they too have understanding, desire, and body as their causes, since they come to be as a result of human bodily movements caused by the understanding and desire of the craftsman (*Z* 7 1032<sup>a</sup>33–<sup>b</sup>6, *Θ* 5 1048<sup>a</sup>10–21).

#### Note 1316

**There is another way in which the causes are analogically the same, namely, activity and potentiality:** The causes are form, lack, and matter (*A* 4 1070<sup>b</sup>25–34). Another way in which these are analogically the same is from the perspective of activity and potentiality—for example, form is activity, matter potentiality (1071<sup>a</sup>8–11).

#### Note 1317

**For in some cases the same thing is sometimes active and sometimes potential—for example, wine or flesh or human:** Something is actively wine when the form of wine is the relevant causal factor, and potentially wine when its matter is the relevant causal factor. Similarly for flesh or human (*A* 2 1069<sup>b</sup>14–15n).



## Note 1318

**The aforementioned causes:** Form, lack, and matter (A 4 1070<sup>b</sup>25–34).

## Note 1319

**The form actively is, if it is separable:** The thought is apparently about the forms of matter-form compounds (such as that of a house), which can exist in separation from the matter in the soul of the craftsman (A 3 1070<sup>a</sup>13–19). The forms of natural compounds are active, although they are not separable from matter at all (© 8 1050<sup>b</sup>2–3).

**The lack is, for example, darkness or sickness (*kamnon*):** Presumably, the example is as at A 4 1070<sup>b</sup>28, with *kamnon* here substituting for *nosos* (“sickness”) there. We are not explicitly told how to see these from the perspective of potentiality and actuality, but, since each is a lack, and “the lack too is form in a way” (*Ph.* II 1 193<sup>b</sup>19–20), we are presumably to group them with the form.

**The matter, on the other hand, potentially is, since it is what is capable of becoming both:** See A 2 1069<sup>b</sup>14–15, 4 1070<sup>b</sup>12–13.

## Note 1320

**But active and potential differ in another way in the case of things whose matter is not the same, of which the form is not the same but distinct:** X’s father E (for efficient) is X’s moving or efficient cause. X’s matter is  $m_1$ , a specific quantity of fire and earth, which is obviously distinct from E’s matter  $m_2$ . Prior to X’s coming to be,  $m_1$  was potentially but not actually a human being, whereas E was actually a human being. These two causes,  $m_1$  and E, differ both with respect to their matter ( $m_1 \neq m_2$ ) and with respect to their form ( $m_1$  does not yet have human form, E does).

**The cause of a human is both his elements, and furthermore some other external thing, such as the father:** See Z 9 1034<sup>b</sup>1–3n.

**And beyond these the sun:** X’s father E and the sun S are efficient causes of X. But they are not efficient causes in the same way. For though S and E both differ in their matter and in their form from X, S is not in actuality what X’s matter ( $m_1$ ) is potentially. Thus there are two ways in which a potential being (material cause) and an actual being (efficient cause) can be joint causes of a matter-form compound.

**And its movement in an inclined circle:** See A 6 1072<sup>a</sup>9–12n.

## Note 1321

**Already the causes and elements of substances (but distinct ones of distinct ones) are, as has been said, the causes and elements of things that are not in the same kind—of colors, sounds, substances, quantity—save by analogy:** That the causes of substances are thereby the causes of all things was stated at 1070<sup>b</sup>36–1071<sup>a</sup>2, but neither analogy nor kinds were mentioned there. A 4 1071<sup>a</sup>31–33 states that the causes of all things are the same analogically, 1071<sup>b</sup>19–20 that they are distinct for distinct kinds.

## Note 1322

**The first in terms of actuality is a cause of all things:** See A 4 1070<sup>b</sup>34–35.

Note 1323

**There are distinct direct (*prôta*) causes:** *Prôton*, which is used to mean “first” at 1071<sup>a</sup>36, is now used to mean “direct” or “proximate.”

**The contraries that are said of things not as genera:** With the result that those belonging to one particular are distinct from those belonging to another (1071<sup>a</sup>25–29). **Furthermore the matters:** See A 2 1069<sup>b</sup>24–26.

Note 1324

**Since there were three sorts of substances, two of them natural and one immovable:** See A 1 1069<sup>a</sup>30–<sup>b</sup>2. The focus now is on [3] eternal immovable substances.

Note 1325

**It is impossible that movement either came into being:** “If each of the movable things came to be, then before the movement in question there must have been another change and movement, in which the thing itself that was capable of being moved or of moving [things] came to be. To suppose, on the other hand, that things always preexisted without there being movement is evidently absurd and all the more so as we examine the matter scientifically. . . . For if some things are capable of being moved and others capable of moving things, and if at some future time there will be a first mover and a corresponding thing that is moved, whereas at another time there is no movement, but only rest, then this first mover must have changed earlier. For there was some cause of its being at rest, since rest is the lack of movement. And so before the first change there will have been a change that is earlier” (*Ph.* VIII 1 251<sup>a</sup>18–28).

**Or passed away:** “The same argument applies to movement being incapable of passing away. For just as the coming to be of movement implied a change earlier than the first movement, so the passing away of movement implies one later than the last one. For being moved and being capable of being moved do not cease at the same time . . . nor do being capable of moving something and moving it. And what is capable of causing something to pass away, then, will have to pass away when it has caused the thing to pass away. And what is capable of causing *this* to pass away must in turn pass away later, since passing away too is a sort of change. If, then, these things are impossible, it is clear that there is eternal movement, not movement at one time, rest at another. In fact to say such things seems more a matter of fabricating stories” (*Ph.* VIII 1 251<sup>b</sup>28–252<sup>a</sup>5).

**For at every point it was (*aei gar ên*):** The idea (as in *Ph.* VIII) is that movement existed before it supposedly came into being and after it supposed passed away, so that at every point—that is, both before its supposed coming to be and after its supposed passing away—it was.

**There cannot be a before and an after if there is no time:** If time came to be at *t*, before *t* there was no time; if time passed away at *t*, after *t* there was no time. Both are taken to be absurd.

Note 1326

**Movement too is continuous, then, in the way that time also is:** “Since every movement is continuous, a movement that is unconditionally one must (if indeed

every movement is divisible) be continuous, and a continuous movement must be one. For there will not be continuity between any movement and any other, any more than there is between one random thing and another random thing, but in those whose extremities are one. But some things have no extremities at all, while other things do have extremities but they are distinct in species and are homonyms. For how could the extremity of a line touch or become one with the extremity of walking? Movements might be contiguous, it is true, even if they are the same either in species or in genus, since a man may run and immediately afterward fall ill with a fever, and in a relay-race, we have contiguous spatial movement, but not continuous. For the continuous was posited to be that whose extremities are one. So movements may be contiguous or successive in virtue of the time being continuous, but there can be continuity only in virtue of the movements being continuous, that is, when the extremities of both become one" (*Ph.* V 4 228<sup>a</sup>20–<sup>b</sup>1). For definitions of continuous, contiguous, and successive, see K 12 1068<sup>b</sup>26–1069<sup>a</sup>14.

**Since time is either the same thing as movement or an attribute of it:** "Time is this—the number of movement with respect to before and after" (*Ph.* IV 11 219<sup>b</sup>1–2).

#### Note 1327

**There is no continuous movement except movement in place:** "It is evident from the following that none of the other movements [besides spatial movement] can be continuous: All the other movements or changes are from opposites to opposites . . . and changes to contraries are contrary. . . . It is evident, then, that something that is changing will come to rest in a contrary. . . . So if a thing cannot be changing in opposite directions at the same time, the change will not be continuous, but rather there will be a time between changes" (*Ph.* VIII 7 261<sup>a</sup>31–<sup>b</sup>7).

**And of this only that which is circular is continuous:** "The movement of everything that is in a process of spatial movement is either circular or rectilinear or a mix of the two, so that if one of the former two is not continuous, the one composed of both cannot be either. But it is clear that if the spatial movement of a thing is rectilinear and finite, it is not continuous spatial movement, since it must turn back. But what turns back in a straight line has contrary movements. . . . It is most evident that a rectilinear movement cannot be continuous, however, from the fact that to turn back the object must stop" (*Ph.* VIII 8 261<sup>b</sup>27–262<sup>a</sup>14); "A circular movement, on the other hand, will be one and continuous. For nothing impossible follows. For what is moving from A will at the same time be moving to A with the same forward movement . . . but without having contrary or contradictory movements at the same time. . . . So there is nothing to prevent the movement from being continuous and without temporal intermission. For circular movement is movement from A to A, whereas rectilinear movement is from A to another [place]" (264<sup>b</sup>9–19).

#### Note 1328

**If there is something that is capable of moving things (*kinêtikon*) or acting on them (*poiêtikon*):** "What is capable of acting on things (*to poiêtikon*) is a cause in the sense of being the starting-point from which the movement comes. The for-the-sake-of-which is not capable of acting on them (*ou poiêtikon*). That is why health

[a final cause] is not capable of acting, except metaphorically” (GC I 7 324<sup>b</sup>13–15); “The activity of what can act on things (*tou poiêtikou*) and move them (*kinêtikou*) takes place in what is affected, that is why it is not necessary for what moves things to be itself moved” (DA III 2 426<sup>a</sup>4–6). See also A 8 1074<sup>a</sup>19–23, 10 1075<sup>b</sup>31.

Note 1329

**Another substance beyond the Forms:** That is, “the one,” from which, together with the indefinite dyad, the Forms are composed (A 6 987<sup>b</sup>20–22).

Note 1330

**There must, therefore, be such a starting-point, the substance of which is activity:** This is the so-called *prime mover*.

Note 1331

**Accordingly, these substances must be without matter:** If the substance (= form or essence) of an eternal substance is activity, it cannot be a matter-form compound, because matter is potentiality (© 6 1048<sup>a</sup>35–<sup>b</sup>6).

**These substances:** For an explanation of the plural, see A 8 1073<sup>a</sup>22–<sup>b</sup>3.

Note 1332

**The theologians who generate things from night:** Hesiod, *Theogony* 124, *Works and Days* 17.

**The physicists who say that “all things were together”:** See A 1 1069<sup>b</sup>20–23n.

Note 1333

**The menstrual fluid or the earth will not move themselves, but the seeds and the semen will:** In animal sexual reproduction the female menstrual fluid is the matter that is formed into the fetus by the male semen (Z 9 1034<sup>b</sup>1–3n). In the growth of plants, the seeds extract nourishment from the earth for the emerging seedling.

Note 1334

**Leucippus and Plato posit eternal activity:** “Leucippus and Democritus . . . say that the primary bodies [= atoms] are in perpetual movement in the void or unlimited” (*Cael.* III 2 300<sup>b</sup>8–10).

**And Plato:** “The god wished everything to be good and nothing to be bad so far as that was possible, and so he took over all that was visible, which was not at rest but in discordant and disorderly movement, and brought it from disorder to order, because he thought that order was in every way better than disorder” (*Ti.* 30a2–6).

Note 1335

**Nothing is moved randomly, but there must always be some particular sort (*ti*) present:** I take the indefinite pronoun *ti* to refer to some particular sort of movement, but it is possible to take it to refer instead to a particular sort of mover or moving cause.

Note 1336

**What sort of movement is primary?** “It must be investigated whether it is possible for there to be a continuous movement or not, and, if there can, what that

movement is, and which one of the movements is primary. For it is clear that if indeed there must always be movement, and if a given movement is primary and continuous, then it is this movement that the prime mover causes, and so it is necessarily one and the same and continuous and primary. And of the three sorts of movements, the one with respect to magnitude, the one with respect to affection, and the third with respect to place (which we call 'spatial movement'), it is the last that must be primary. For it is impossible for there to be growth without a prior alteration. For what grows in one way grows by what is like it, but in another by what is unlike it—for contrary is said to nourish contrary. But in everything that comes to be, like is added to like. But then if there is *alteration* [= change with respect to affection], there must be something that does the altering and makes, for example, what is potentially hot, actively hot. It is clear, then, that the mover is not always in the same position, but sometimes closer, sometimes further away, from what is altered. But this could not occur without spatial movement. If, therefore, there must always be movement [or change], spatial movement must always exist as the primary movement, and if there is a primary and a posterior sort of spatial movement, the primary sort" (*Ph.* VIII 7 260<sup>a</sup>21–b7).

#### Note 1337

**In the case of Plato, at any rate, it is not possible even to state what he sometimes thinks the starting-point is, namely, what moves itself:** What moves itself, and is thus the self-moving cause of all other movements, is the soul (*Phdr.* 245c3–246a2, *Lg.* 894c3–899b9), which should therefore be coeval with the heaven and its movements. Yet in the *Timaeus* it is created by the Demiurge (34b10–c9) at a time later than the movements existing in the receptacle (30a2–6).

#### Note 1338

**Capacity is prior to activity in one way correct and in another way not—and it has been stated how:** The reference may be 1071<sup>b</sup>22–26, although it is not stated there how capacity is prior to activity and how not. So it may, it seems, instead be to the extensive discussion of the topic in *Θ* 8.

#### Note 1339

**If, then, there is a constant cycle, something must always remain, acting in the same way. And if there is to be coming to be and passing away, there must be something else that is always acting now in one way now in another:** "Since we have posited and shown that things are subject to continuous coming to be and passing away, and since we say that spatial movement is the cause of coming to be, it is evident that if the spatial movement is one, it will not be possible for both processes to occur, because they are contraries. For what is the same, and remains in the same state, by its nature produces the same thing, so that either coming to be or passing away will always occur. And so the spatial movements must be more than one and must be contraries, either because of the direction of their movement or because of its irregularity, since contraries have contraries as their causes. That is why it is not the sun's primary spatial movement that is the cause of coming to be and passing away, but that in the inclined circle. For in this there is both

continuity and being moved in two movements. For if coming to be and passing away are always to be continuous there must on the one hand be something that is being moved, so that these changes do not fail, and on the other hand two movements, in order that not only one of the two processes will occur. The spatial movement of the whole [that is, the primary heaven—the ethereal sphere of the fixed stars], then, is the cause of the continuity, whereas the inclination is the cause of the approach and retreat. For this results in its becoming further away at one time and closer at another, and since the distance is unequal the movement will be irregular. So, if it causes coming to be by approaching and being close, this same thing causes passing away by retreating and becoming further away; and if it causes coming to be by repeatedly approaching, it also causes passing away by repeatedly retreating. For contraries have contraries as their causes, and natural passing away and coming to be occur in equal periods of time. That is what the times—that is, the lives—of each sort of thing has a number that determines it” (GC II 10 336<sup>a</sup>23–<sup>b</sup>12).

Note 1340

**It is better to say that it is the first:** A is required anyway to explain the constant cycle. B acting in way<sub>1</sub> causes coming to be and in way<sub>2</sub> passing away. But B’s acting in these ways is itself a constant cycle. If C is introduced to cause it, we have an unnecessary extra cause.

Note 1341

**This, therefore, is the way the movements actually take place:** The observed movements are in agreement with what is uncovered by theorizing.

Note 1342

**Why, then, inquire after other starting-points?:** Such as, for example, Platonic Forms (1071<sup>b</sup>14–17).

Note 1343

**They would have come from night:** See A 6 1071<sup>b</sup>26–27.

**Or all things together:** See 1071<sup>b</sup>27–28.

**Or from not being:** See A 2 1069<sup>b</sup>19–23.

**These issues (*tauta*) may be taken as resolved (*luoit*):** Puzzles or *aporiai* are what usually receive a resolution or *lusis*, so the referent of *tauta* may be to the puzzles that arise for those who think that capacity (potentiality) is prior to activity (A 6 1071<sup>b</sup>22–23). But since these seem to be already (somewhat) resolved by 1072<sup>a</sup>4, it is more likely that Aristotle is also (or instead) referring to the puzzles (1071<sup>b</sup>33–1072<sup>a</sup>3) left unresolved by those thinkers who posited eternal activity, such as Leucippus and Plato (1071<sup>b</sup>31), as well as that of eternal coming to be and passing away (1072<sup>a</sup>10–11), which is left unresolved even by those—Anaxagoras, Empedocles, Leucippus—wise enough to make activity prior to capacity (1072<sup>a</sup>4–7).

Note 1344

**There is something that is always moved with an unceasing (*apauston*) movement:** See A 6 1071<sup>b</sup>12–22. The eternality (1071<sup>b</sup>19) of the movement entails its being unceasing and is entailed by its being in substance or essence an activity (1071<sup>b</sup>19–20).

**This is clear not from argument alone but also from the facts** (*ou logô[i] monon all' ergô[i]*): The facts of astronomical observation. The same contrast occurs in GA I 21 729<sup>b</sup>8–9.

Note 1345

**The primary heaven would be eternal:** The primary or first heaven is the outermost transparent sphere of the fixed stars, which moves in a simple circular movement (*Cael.* II 6 288<sup>a</sup>13–17, 12 292<sup>b</sup>22–23).

Note 1346

**There is, therefore, also something that moves it:** Namely, the prime mover of A 6 1071<sup>b</sup>19–20.

Note 1347

**But since what is moved and moves something is something medial, there is something that moves without being moved:** Reading ἐπεὶ δὲ τὸ κινούμενον καὶ κινεῖν μέσον, ἔστι τι ὃ οὐ κινούμενον κινεῖ with Ross for OCT ἐπεὶ δὲ τὸ κινούμενον καὶ κινεῖν καὶ μέσον . . . τοίνυν ἔστι τι ὃ οὐ κινούμενον κινεῖ. Laks retains καὶ before μέσον to read “But since what is moved and moves something also [by this very fact] is something medial.”

Note 1348

**This, though, is the way the object of desire and the intelligible object move things: they move them without being moved:** It follows that the primary heaven is moved as by an object of desire or an intelligible object. It must, then, have an understanding with which to grasp that object and a desire that is moved by it: “desire and the desiring part cause movement by being moved” (*MA* 6 700<sup>b</sup>35–701<sup>a</sup>1). It follows that “the heaven is animate and possesses a starting-point of movement” (*Cael.* II 2 285<sup>a</sup>29–30).

Note 1349

**Of these objects, the primary ones are the same:** 1072<sup>a</sup>30–34 argues that within the column of intrinsically intelligible opposites, which are the objects of understanding, is the sub-column of substances, which is further divided into substances of different degrees of primacy, with unqualified primacy assigned to a substance that is both simple and an activity. 1072<sup>a</sup>34 locates the real good in the same place, on the grounds that what is best (the good or best good) has the sort of primacy among objects of choice that the most primary substance has among intelligible objects. For the primary object of wish is the real good, which is identical to the prime mover, or mover of the primary heaven, which is itself a substance and an activity, and so an intelligible object.

Note 1350

**The [primary] object of appetite is the apparent noble (*kalon*), and the primary object of wish is the really noble (*to on kalon*):** “Should we say that unconditionally and in truth the object of wish is the good, but to each person it is the apparent good? To an excellent person, it is what is truly the proper [= primary] object; to a

base one, it is whatever random thing it happens to be. . . . In the case of ordinary people, however, deception seems to come about because of pleasure, which appears to be a good thing when it is not. So they choose what is pleasant as good and avoid what is painful as bad" (NE III 4 1113<sup>a</sup>23–<sup>b</sup>2); "Appetite is concerned with what is pleasant and what is painful" (2 1111<sup>b</sup>16–17). As we see from these texts, Aristotle often speaks of the good rather than the noble in making this point. His reason for switching to *kalon* here is given at M 3 1078<sup>a</sup>31–32.

### Note 1351

**We desire something because it seems [good] rather than its seeming so because we desire it. For the starting-point is the active understanding. And understanding is moved by intelligible objects:** "Both of these, therefore, can produce movement with respect to place, understanding and desire—understanding, though, that rationally calculates for the sake of something and is practical, and which it differs from theoretical understanding with respect to its end" (DA III 10 433<sup>a</sup>13–15); "That which produces movement will be one in kind (*eidos*), the desiring part qua desiring—and the first mover of all is the object of desire. For this produces movement without being moved, by being actively understood (*noêthênai*) or actively imagined" (433<sup>b</sup>10–12); "Understanding evidently does not move anything without desire—for wish is a desire, and when movement is in accord with calculation, it is in accord with wish. . . . Hence what moves us in every case is the desired object, which is either the good or the apparent good; and not every good but the good doable in action" (433<sup>a</sup>22–29).

**Intelligible objects:** See A 1 981<sup>a</sup>6n.

**What is intelligible intrinsically is the one column [of opposites]:** The two columns of opposites are columns of starting-points (A 5 986<sup>a</sup>23n), which, as such, are objects of understanding (α 1 993<sup>b</sup>11n). One of them, however, because it consists of lacks (K 9 1066<sup>a</sup>14–16), is not intrinsically intelligible (Θ 2 1046<sup>b</sup>10–12).

**In this substance is primary, and in this the simple one and an activity—one-ness and simplicity are not the same:** A 6 1071<sup>b</sup>20–22 recognizes the existence of a number of substances that are activities, among which it is now claimed the simple one is primary. The basis for the claim is not specified, but one way to cash it out is in terms of the sort of movement that the desiderative understanding of it causes in the primary heaven: "It is best of all for everything to attain the ultimate end, or if not that, it is always better the closer it is to the best [= the real good]. And this is why the earth does not move at all, whereas the heavenly bodies close to it have few movements, since they do not reach the final end, but come as close to attaining it as their share of the most divine starting-point permits. The primary heaven, however, attains it immediately by means of a single movement. Those intermediate between the primary heaven and the last one, by contrast, do attain it, but by means of several movements" (*Cael.* II 12 292<sup>b</sup>17–25).

**Unity signifies a measure:** See Δ 6 1016<sup>b</sup>18–21.

### Note 1352

**The for-the-sake-of-which** (*to hou heneka*): "The for-the-sake-of-which is two-fold—the purpose for which and the beneficiary for whom" (DA II 4 415<sup>b</sup>2–3).



**That the for-the-sake-of-which does exist among immovable things is made clear by a distinction:** See B 2 996<sup>a</sup>22–<sup>b</sup>1 (= [P1]). The ultimate for-the-sake-of-which is the noble or good.

Note 1353

**It produces movement insofar as it is loved, whereas it is by being moved that the other things move:** An important point of continuity between Aristotle's account and that of philosophers such as Parmenides and Empedocles who also assign a fundamental cosmological role to love (A 4 984<sup>b</sup>24, 985<sup>a</sup>6).

Note 1354

**There is something that moves while it itself is immovable, though it is in activity:** "There is not only an activity of moving (*kinêseôs energeia*) but also an activity of immobility (*akinêsias*)" (NE VII 14 1154<sup>b</sup>26–27).

Note 1355

**What does not admit of being otherwise, but is unconditionally necessary:** See Δ 5 1015<sup>b</sup>11–15, which associates unconditional necessity with simplicity.

Note 1356

**Its pastime (*diagôgê*):** "Philosophy seems to involve pleasures that are wondrous for their purity and stability, and it is quite reasonable that those who have attained knowledge should pass their time more pleasantly than those who are looking for it" (NE X 7 1177<sup>a</sup>25–27); "The activity of understanding seems to be superior in excellence because it is contemplative, to seek no end beyond itself, and to have its own proper pleasure, which increases the activity by its own increase, and . . . in addition the self-sufficiency, leisured quality, and unweariness (so far as this is possible for a human being), as well as all the other attributes assigned to the blessed, are evidently attributes of it" (1178<sup>a</sup>19–24). On the connection between *diagôgê* and leisure, see A 1 981<sup>b</sup>18n.

**Its activity is also pleasure:** "Presumably, though, it is even necessary that if there are indeed unimpeded activities of each state, no matter whether happiness is the activity of all of them or of one of them in particular, then this activity, insofar as it is unimpeded, is the most choiceworthy. But this *is* pleasure. So the best good might be some sort of pleasure, even if most pleasures turned out to be bad—even unconditionally bad" (NE VIII 13 1153<sup>b</sup>9–14).

Note 1357

**Active understanding, though, is intrinsically of what is intrinsically best, and the sort that is to the highest degree best is of what is to the highest degree best:** "Since every perceptual capacity is active in relation to its perceptible object, and completely so when it is in good condition in relation to the noblest of its perceptibles (for a complete activity seems to be most of all something of this sort, but whether it is the perceptual capacity itself that is said to be active or the subject that perceptual capacity is in makes no difference), in the case of each perceptual capacity, the best activity will be, then, the activity of the subject that is in the best condition in relation to the most excellent of its objects. And this activity will be

the most complete and most pleasant. For with every perceptual capacity there is a pleasure connected, and the same holds for both thought and contemplation. But the most pleasant is the most complete, and the most complete is the activity of a subject that is in good condition in relation to the most excellent of the relevant objects" (NE X 5 1174<sup>b</sup>14–23).

#### Note 1358

**The understanding actively understands itself by partaking of the intelligible object. For it becomes an intelligible object by touching and understanding one, so that understanding and intelligible object are the same:** "The understanding is in a way the intelligible objects potentially, although it is none actually before it understands [them]—and it is potentially [these] in the same way as there is writing on a wax tablet on which there is nothing actually written. That is just how it is in the case of the understanding. And it is an intelligible object in just the way its intelligible objects are, since, in the case of those things that have no matter, that which understands and that which is understood are the same, since theoretical scientific knowledge and what is known in that way are the same. In those that have matter each of the intelligible objects is present potentially" (DA III 4 429<sup>b</sup>30–430<sup>a</sup>7). On the metaphor of touching and its importance, see Θ 10 1051<sup>b</sup>24n.

#### Note 1359

**What is receptive of the intelligible object and the substance is the understanding, and it is active when it possesses it:** Understanding is like "the visual perception of intelligible things" (*Protr.* B24), and it is on vision in particular that the account of understanding is modeled: "as that which is capable of perceiving is to perceptibles, so must the understanding be to intelligible ones" (DA III 4 429<sup>a</sup>17–18); "understanding is a potentiality for being such things [intelligible objects] without their matter" (430<sup>a</sup>7–8). This receptive constituent is "passive understanding" (*pathêtikos nous*) (5 430<sup>a</sup>24–25), which "serves as matter for each kind (*genos*) of thing" (430<sup>a</sup>10–11). In addition, there is also a productive or active constituent in understanding, which is "its cause and is productive in that it produces it" and is related to passive understanding "in the way, for example, that a craft is to its matter" (430<sup>a</sup>12–13). This is productive or active understanding (*nous poiêtikos*) (430<sup>a</sup>15).

The relationship between the two sorts of understanding—active and passive—is explained by analogy with the role of light in color perception: "To the [passive] understanding . . . that becomes all things there corresponds the understanding that makes all of them, as some kind of state, like light, does. For in a way light too makes potential colors into active colors" (5 430<sup>a</sup>14–17). For (1) just as light, which is itself a color, is a visible object, so productive understanding is an intelligible one, since "it can understand itself (*auton*)" (4 429<sup>b</sup>9); (2) just as no color is an actual color without light, so without productive understanding, passive understanding "understands nothing" (5 430<sup>a</sup>25); and (3) just as light, since it is the actualization of "the transparent qua transparent" (II 7 418<sup>b</sup>9–10), is never merely a potential color, needing to be made actual by something else, so productive understanding is in "substance or essence an activity" (III 5 430<sup>a</sup>18).

**This rather than that seems to be the divine thing that understanding possesses:** Reading (1) ὥστ' ἐκεῖνο μᾶλλον τοῦτου ὃ δοκεῖ ὁ νοῦς θεῖον ἔχειν with Laks and the mss. for OCT and Ross (2) ὥστ' ἐκείνου μᾶλλον τοῦτο ὃ δοκεῖ ὁ νοῦς θεῖον ἔχειν. In (2) "this" (*ekainou*) refers to active understanding and "that" (*touto*) refers to receptive understanding, both understood from the previous sentence, which appears in brackets in the translation. In (1) "this" (*ekaino*) refers to self-understanding through partaking of the intelligible object, while "that" (*toutou*) refers to the partaking of the intelligible object, both understood from the sentence prior to the parenthetical one (1072<sup>b</sup>19–20).

**Contemplation (*theōria*) seems to be most pleasant and best:** "That complete happiness [= the best good] is some contemplative activity will also be evident from the following considerations. The gods, in fact, we suppose to be the most blessed and happy of all. But what sorts of actions should we assign to them? Just ones? Won't they appear ridiculous if they engage in transactions, return deposits, and so on? Courageous ones, then, enduring what is frightening and facing danger because it is a noble thing to do? Or generous ones? To whom will they give? It will be a strange thing, if they actually have money or anything like that. And their temperate actions, what would they be? Or isn't the praise vulgar, since they do not have base appetites? If we were to go through them all, it would be evident that everything to do with actions is petty and unworthy of gods. Nonetheless, everyone supposes them to be living, at least, and hence in activity, since surely they are not sleeping like Endymion. If, then, living has doing actions taken away from it and still more so producing, what is left except contemplating? So the activity of a god, superior as it is in blessedness, will be contemplative. And so the activity of humans, then, that is most akin to this will most bear the stamp of happiness" (NE X 8 1178<sup>b</sup>7–23).

#### Note 1360

**If, then, that good state [of activity], which we are sometimes in, the [primary] god is always in, that is a wonderful thing, and if to a higher degree (*mallon*), that is yet more wonderful:** The first (always/sometimes) part of the contrast is clear, the second is less so, although we can piece together a reasonable picture of what Aristotle has in mind.

(1) One element in that picture has to do with priority: "We call something to a higher degree [F] not only in accord with excess, when [F] is one in account, but also in accord with priority and posteriority. For example, we call health *mallon* good than healthy things, and what is by its own intrinsic nature choiceworthy *mallon* choiceworthy than the things that produce it" (*Protr.* B85). One way, then, in which the primary god is more in the good state of activity than we are is that because he is the prime mover his activity is prior to ours and a condition of it.

(2) A second element in the picture has to do with simplicity and the consequences of lacking it: "In no case, though, is the same thing always pleasant, because our nature is not simple but also has another element in it, in that we are mortals. As a result, if one of the two is doing something, it is contrary to the nature of our other nature, and when the two are equally balanced, what we are doing

seems neither painful nor pleasant. For if the nature of some being were simple, the same action would always be most pleasant. That is why the god always enjoys a single simple pleasure. For there is not only an activity of moving but also an activity of immobility, and pleasure is found more in rest than in movement. ‘Change in all things is sweet,’ as the poet says, because of a sort of wickedness. For just as a wicked human being is an easily changeable one, a nature that needs change is also wicked, since it is neither simple nor decent” (NE VII 14 1154<sup>b</sup>20–31).

(3) A third element has to do with getting tired: “So long, then, as the intelligible object or the perceptible one and what discerns or contemplates are as they should be, there will be pleasure in the activity. For when what is affected and the thing producing the effect are similar and keep in the same relation to each other, the same thing naturally arises. How is it, then, that no one is pleased continuously? Or is it that we get tired? For continuous activity is impossible for all things human. So no continuous pleasure arises either, since it is entailed by the activity. Some things delight us when they are novelties, but later delight us less, because of the same thing. For at first thought is called forth and is intensely active regarding them, as happens in the case of our sight when we look hard at something, but later the activity is no longer like that but has grown relaxed, so that the pleasure is dimmed as well” (NE X 4 1174<sup>b</sup>26–1175<sup>e</sup>10; compare Θ 8 1050<sup>b</sup>22–28).

(4) A fourth element has with the complexity of the actions that need to be done to reach the best good: “Here it is a human being whose actions are most various. For there are many goods that he can attain, so that his actions are of many sorts, and for the sake of other ends. What is in the best state, by contrast, has no need of action, since it is itself the for-the-sake-of-which, and action always consists in two things, the for-the-sake-of-which and what is for the sake of this. The actions of the other animals are less various, whereas plants have some slight action and presumably a single sort. For either they have some one attainable end, as indeed a human being has, or, if several, they are all routes to the best one. One thing, then, has and participates in the best, one reaches it by means of few actions, one by means of many actions, and one does not even attempt to secure it, but is content to reach a point close to the ultimate end” (*Cael.* II 12 292<sup>b</sup>2–13).

#### Note 1361

**Life too certainly belongs to him:** Because understanding is an activity of soul, which is the primary recipient of life (Δ 18 1022<sup>a</sup>32).

#### Note 1362

**Living (ζῆν) and continuous and everlasting eternity (αἰὼν αἰδῖος) belong to the god:** “It is clear that neither place nor void nor time exists outside the [primary or outermost] heaven. . . . That is why the things there are of such a nature as not to be in a place, nor does time make them age, nor does anything situated beyond the outermost spatial movement undergo change. Instead, unalterable and impassive and possessing the best and most self-sufficient life, they are achieving their end for all eternity (αἰῶνα). And in fact this name *aiōn* had divine significance for the

ancients. For the end that encompasses (*periechon*) the lifetime of each animal has been called the life-span (*aiôn*) of each. For the same reason the end of the entire heaven, and the one that encompasses the whole of time and its unlimitedness, is eternity (*aiôn*), having got the name from its always existing (*aiei einai*), immortal and divine" (*Cael.* I 9 279<sup>a</sup>11–28).

#### Note 1363

**Those who take it, as the Pythagoreans and Speusippus do, that the noblest and best is not present in the starting-point:** See N 4 1091<sup>a</sup>29–1092<sup>a</sup>5, 5 1092<sup>a</sup>11–17.

**The Pythagoreans:** See A 5 and notice the late place of good in the column of opposites (986<sup>a</sup>26).

**Speusippus:** F 42 Tarán.

#### Note 1364

**The seed comes from other things that are prior and complete:** See @ 8 1049<sup>b</sup>17–27.

#### Note 1365

**It has also been shown that this substance cannot have any magnitude, but must be without parts and indivisible:** What has been explicitly shown is that primary god moves the primary heaven for an unlimited time (A 6 1072<sup>b</sup>12–20). The next sentences (1073<sup>a</sup>7–11) explain why it must, therefore, be without parts and indivisible. Compare 1073<sup>a</sup>10.

#### Note 1366

**It has also been shown that it is impassive and unalterable:** What has been explicitly shown is that the primary god is immovable with respect to place. The next sentence explains why this entails impassivity and inalterability. The pattern is thus the same as at 1073<sup>a</sup>5.

#### Note 1367

**All the other movements are posterior to that with respect to place:** See A 6 1071<sup>b</sup>36n.

#### Note 1368

**They say nothing that can even be perspicuously stated about how many they are:** Note the contrast drawn at 1073<sup>b</sup>1–17 between the philosophical question of how many unmoved substantial movers there are, on which the others (= other philosophers, especially Platonists) have said nothing that can be perspicuously stated, and the scientific question of the number of movements possessed by the various heavenly bodies, on which mathematicians and astronomers have said quite precise and perspicuously stated things (1073<sup>b</sup>17–38).

#### Note 1369

**Those who accept the Ideas . . . sometimes speak as if they were unlimited, sometimes as if, being defined up to ten, they were finite:** "Plato posits numbers up to ten" (*Ph.* III 6 206<sup>b</sup>31–32). See also M 8 1084<sup>a</sup>12–<sup>b</sup>2 and A 5 986<sup>a</sup>8–9 (Pythagorean origins).

Note 1370

**A single movement must be produced by a single thing:** Argued for at 1074<sup>a</sup>17–22. We see that beyond the simple spatial movement of the universe (*tou pantos*), which we say the primary and immovable substance produces: Here the simple movement of the universe (= “the spatial movement of the whole” at GC II 10 336<sup>b</sup>3) is that of the primary heaven, which is so called because it encompasses everything except the primary god (*Cael.* I 9 279<sup>a</sup>11–28, quoted in A 7 1072<sup>b</sup>30n). See also A 1 1069<sup>a</sup>19n.

**The body with a circular movement is eternal and unresting, as has been shown in our works on natural science:** *Ph.* VIII 8–9, *Cael.* I 2, II 3–8.

**Each of these spatial movements must be produced by a substance that is both intrinsically immovable and eternal:** Each thing that has a spatial movement distinct from the simple circular movement of the primary heaven needs an immovable mover of its own to move it, which is why each of them must have understanding and desire. They are animals, after all, and their movements are explicable in the same way as those of other relevantly similar animals, such as ourselves: “Just as in the whole it is the [primary] god, so it is too in us. For the divine constituent in us [= understanding or reason] in a way does all the moving. Of reason, however, the starting-point is not reason, but something superior. But what besides the [primary] god is superior to both scientific knowledge and understanding, since virtue [of character] is an instrument of understanding?” (*EE* VIII 2 1248<sup>a</sup>25–29). What moves each immovable mover’s understanding, however, is its intelligible object, namely, the prime mover (A 7 1072<sup>a</sup>26–27).

Note 1371

**The nature of the stars is eternal, because it is a certain sort of substance:** See Z 17 1041<sup>b</sup>28–31.

**The stars:** Both the fixed stars and the planets are meant.

Note 1372

**It is evident, then, that there must be this number of substances that are . . . without magnitude (due to the cause mentioned earlier):** At A 7 1073<sup>a</sup>5–11.

Note 1373

**Eudoxus posited that the spatial movement of the sun and the moon in each case involves three spheres:** The goal of the theory was to explain the apparent movements of the heavenly bodies in terms of circular movements only.

**The third moves in the circle inclined across the breadth of the zodiac:** It is not entirely clear what this sphere is supposed to explain.

**Eudoxus:** See A 9 991<sup>a</sup>17n.

Note 1374

**Callippus:** Callippus of Cyzicus, who flourished c. 330 BC, studied with a friend of Eudoxus, and is said to have stayed with Aristotle in Athens helping him explore and criticize Eudoxus’ views.

**The appearances (*ta phainomena*):** See A 5 986<sup>b</sup>31n.

## Note 1375

**If all the spheres combined are to account for the things that appear, for each of the planets there must be other spheres:** Aristotle accepts as a geometrical model of the movements of the heavenly bodies the account given by Eudoxus and Callippus. But celestial mechanics, he thinks, requires additional spheres, to explain how the movements of the outermost sphere affects those of the spheres it encompasses.

**The things that appear** (*ta phainomena*): See A 9 1074<sup>b</sup>16n.

**But one fewer, which counteract the former, and in each case restore to the same position the first [or outermost] sphere of the star that is placed beneath the star in question:** Starting with the primary or outermost heaven we have a series of concentric spheres encircling the earth. The sphere of the moon is the innermost celestial sphere, so that below it there is no other (hence “one fewer”). Suppose, then, that A (outermost), B, C, D (innermost) are the four spheres to which, according to Eudoxus and Callippus, Saturn is affixed. Inside sphere D, Aristotle is proposing to insert a first reactive sphere D\*, which rotates on the poles of D and at the same speed, but in the opposite direction. The rotations of D and D\* cancel each other, so that any point on D\* will move as if rigidly connected to C. Inside D\* in turn is placed a second reactive sphere C\*, which is related to C as D\* is to D, so that any point of C\* will move as if rigidly connected to B. Finally, inside C\* is placed B\*, with the result that any point on B\* will move as if rigidly connected to A. But A, as the outermost sphere of Saturn, has the movement of the fixed stars, hence B\* will also have that movement. As a result the spheres of Jupiter, which are inside those of Saturn, can move inside B\* as if Saturn’s spheres did not exist and as if B\* were the sphere of the fixed stars.

## Note 1376

**If we do not add to the moon and the sun the movements we mentioned:** The movements referred to are the four extra ones proposed by Callippus (1073<sup>b</sup>25–26) together with the two reactive spheres needed for the Sun (the moon needs none), for a total of six. It is unclear why Aristotle countenances not adding these spheres, which were added by Callippus to account for the inequality of the seasons.

**All the spheres will be forty-seven in number:** The mss. have forty-seven, but the correct number is forty-nine = fifty-five minus six.

## Note 1377

**The stronger ones:** A reference back, presumably, to the astronomers “who are busying themselves with these issues” (1073<sup>b</sup>15).

## Note 1378

**If furthermore every nature and every substance that is impassive and has intrinsically attained the best end must be regarded as an end:** The argument follows (1074<sup>a</sup>24–31).

**Every nature and every substance:** The nature of a star is a substance (1073<sup>a</sup>34–25).

**Impassive:** See A 7 1073<sup>a</sup>11.

Note 1379

**There is but one heaven** (*ouranos*): *Ouranos* is here the whole universe (A 5 986<sup>a</sup>3n). The argument for this view follows, but is difficult to understand because it moves from the immateriality of an immovable mover to its uniqueness via the claim that (1) "all things that are many in number have matter" (1074<sup>a</sup>33–34, Z 8 1034<sup>a</sup>5–8). But (1) seems flatly inconsistent with the conclusion just reached to the effect that (2) there are forty-seven or forty-nine immovable movers, all of which are substances, and none of which has matter (A 6 1071<sup>b</sup>20–21). We should bear in mind, however, that all the immovable movers except the prime one are inside the sphere of the primary heaven, and so are in space and time in a way that the prime mover alone is not (*Cael.* I 9 279<sup>a</sup>11–28, quoted in A 7 1072<sup>b</sup>30n). This suggests or implies that even if these other immovable movers are in some way immaterial they nonetheless have a close enough association with the superlunary material element ether (Z 2 1028<sup>b</sup>15n) that constitutes their spheres to account for their multiplicity. The fact that these spheres, as celestial animals, are analogous in structure to ourselves helps us to make some sense of what this association might be.

The soul of the primary heaven needs to have both an understanding and a desiring part if it is to be moved by the prime mover as the object of its desire (A 7 1072<sup>a</sup>26–27). The prime mover, by contrast, just is an understanding (9 1074<sup>b</sup>34–35)—the object of all desire, which as such is itself desireless. Understanding differs from the desiring part of the soul, however, in that it alone is separate from the matter-form compound, and thus from the soul regarded as the form of the body. That is why it alone of the parts of the soul is immortal (3 1070<sup>a</sup>23–26, α 1 993<sup>b</sup>11n).

To say that the prime mover has no matter, then, is literally true; to say that the other immovable movers are matterless is an overstatement, since they essentially have desiring parts, and desiring parts do have matter, just as anger and snubness do. But it is not merely an overstatement. For in characterizing the relationship between us and our understanding Aristotle writes, "just as a city too or any other complex system, seems to be most of all (*malista*) its most controlling part [= the understanding] so also does a human being" (*NE* IX 8 1168<sup>b</sup>31–32). The effect of the adverb *malista* is not to intensify, obviously, but to weaken (numerical identity does not come in degrees). Later, the adverb is dropped, "each person actually is this, if indeed it is the controlling and better element" (X 7 1178<sup>a</sup>2–8), then instantly reinstated "for each human being, then, the life in accord with understanding is so too, if indeed this most of all is a human being" (1178<sup>a</sup>6–7).

So just as we *are* our understandings because we are *most of all* these, the same is true of the non-primary immovable movers. They are not matterless. That is true. But they are most of all something matterless. And the reason they are, since it applies to all complex systems, must be a general teleological one: a complex system is most of all that element for the sake of which all its movements and actions occur—which is just what Aristotle has argued to be true of the celestial spheres (1074<sup>a</sup>17–31). See also *Cael.* II 12 292<sup>b</sup>17–25.



## Note 1380

**The primary essence:** That is, the primary substance of something (Z 7 1032<sup>b</sup>1–2), not the primary or first of the immovable movers. Contrast 1074<sup>a</sup>37.

**Does not have matter:** See A 6 1071<sup>b</sup>20–21.

**Since it is an actuality:** See @ 6 1048<sup>a</sup>35–b6.

## Note 1381

It is likely that each craft and each philosophy has often been developed as far as possible only to pass away again: “We should take it, indeed, that pretty much everything else too has been discovered many times, or rather an unlimited number of times, in the long course of history. For our needs are likely to teach the necessities, and once they are present, the things that add refinement and abundance to life quite naturally develop” (*Pol.* VII 10 1329<sup>b</sup>25–30; also *Cael.* I 4 270<sup>b</sup>19–20, *Mete.* I 3 339<sup>b</sup>27–29). For (1) the world and human beings have always existed (*Mete.* I 14 352<sup>b</sup>16–17, *DA* II 4 415<sup>a</sup>25–b7, *GA* II 1 731<sup>b</sup>24–732<sup>a</sup>3); (2) human beings are naturally adapted to form largely reliable beliefs about the world and what conduces to their welfare in it (α 1 993<sup>a</sup>30–b11, *Rh.* I 1 1355<sup>a</sup>15–17).

## Note 1382

**While the divine understanding seems to be the most divine of the appearances (*tôn phainomenôn*), the question of how it can have that character involves certain difficulties:** At A 8 1074<sup>a</sup>1 the appearances were the celestial phenomena—the visible stars and planets and their observed movements. The divine understanding, which is the prime mover of the primary heaven, seems to be at a further remove from these even than the various transparent heavenly spheres that are posited to account for these phenomena, since it not a visible object at all (not even a transparent one) but an entirely intelligible one. Aristotle does refer, though, to the heaven itself as “the most divine of perceptible things (*ta theiotata tôn phanerôn*)” (*Ph.* II 4 196<sup>a</sup>33–34), and speaks of other things “that are far more divine in nature even than human beings, the most perceptible ones (*phanerôtata*), certainly, being those from which the cosmos is composed” (*NE* VI 7 1041<sup>a</sup>34–b2). It seems likely, therefore, that his characterization of the divine understanding is metonymic: the bodies attached to the first heaven are perceptible, so, by transference from part to whole, the heaven and its mover are perceptible phenomena.

## Note 1383

**It is because of actively understanding that esteem belongs to it:** See A 7 1072<sup>a</sup>30–b1 and, on esteem, A 2 983<sup>a</sup>5n.

## Note 1384

**If it is not active understanding that is its substance but a capacity, it is reasonable to suppose that the continuity of its active understanding is laborious for it:** See @ 8 1050<sup>b</sup>22–28.

## Note 1385

**If its substance is a capacity, it is clear that something else would be more estimable than the understanding, namely, what is understood:** If the divine

understanding (= the prime mover) were a capacity, or a passive understanding, it would be related to what it understands in the way the primary heaven is related to the prime mover. What it would understand, then, would be the best and most divine good (A 7 1072<sup>b</sup>1–30). Since that good, as essentially an activity, would not be identical to the divine understanding, what the latter would understand would be more estimable than it itself is.

#### Note 1386

[1] Next, it is clear that something else would be more estimable than the understanding, namely, what is understood by it. [2] And indeed (*kai gar*) [the capacity] to understand and (*kai*) active understanding will belong even to someone who actively understands the worst thing: The syntactic structure of [2] seems to be *kai gar* . . . *kai*, which yields the meaning: “For both [the capacity] to understand and active understanding . . .,” so that [2] seems to be giving an argument in support of [1]. But how it could be doing so is unclear. For [1] is assuming that the divine understanding is a capacity whose activating object must, in consequence, be better than it is, whereas [2] concerns (indifferently) a capacity to understand or an active understanding whose object is the worst thing. It is more likely, therefore, that [2] is a new difficulty altogether. Syntax permits this, provided we treat the initial *kai* as a conjunction, *gar* as an adverb, and the second *kai* as an independent conjunction. This yields the meaning given in the translation. What [2] does, then, is consider the possibility that the divine understanding owes its value to its substance or essence, whether this is a capacity or an activity, rather than to its object. But if so, it could be understanding the worst thing. But since actively understanding such a thing is to be avoided, it is clearly worse, not better, than only having the capacity to understanding it. It follows that active understanding is not the best thing, contrary to 1074<sup>b</sup>20–21.

#### Note 1387

It is itself, therefore, that it understands, if indeed it is the most excellent (*kratiston*) thing: A parallel passage from the *Magna Moralia* seems to contradict this conclusion: “[1] Since the [primary] god, it is said, possesses all good things and is self-sufficient, what will he do, since he will not simply sleep? He will contemplate something, it is replied. For this is the best and most appropriate thing [for him to do]. What, then, will he contemplate? If he contemplates something other than himself, it must be something better than he. But it is absurd that there should be anything better than the god. Therefore, he will contemplate himself. But that is absurd. For if a human being scrutinizes himself, we criticize him for lacking common sense. It will be absurd, therefore, it is said, for the god to contemplate himself” (II 15 1212<sup>b</sup>38–1213<sup>a</sup>7). But when we see [1] in the context of the immediately preceding sentence (1212<sup>b</sup>35–38) a different picture emerges: [2] “If the [primary] god is self-sufficient and needs no [friends], it does not follow from this that we need none. For the following sort of argument, too, is expressed about the god” (= [1]). The point of [1–2], it is now clear, is that we cannot draw immediate inferences about ourselves from truths about the god, or vice versa. The god is

self-sufficient, and so does not need friends, but it does not follow that a human being has no need of them. To think otherwise would be like arguing [2] that because a human being who spends all his time in self-scrutiny is senselessly narcissistic, so the god would have the same absurd defect were he to contemplate only himself. The argument fails precisely because Narcissus is not the primary god, not the best thing, and so not a worthy object of eternal contemplation. The god, by contrast, as the best thing, is a worthy object of it. For him to contemplate himself, therefore, is not absurd at all. Indeed, if it were absurd, the absurdity would carry over to any other supposed object of his contemplation. Suppose, for example, that the god contemplated the starting-points of the strictly theoretical sciences. When these involve no matter, the contemplation or understanding of them is identical to them (1075<sup>a</sup>3–5). In contemplating them, therefore, the primary god is again contemplating just himself. Narcissism, in other words, is unavoidable, but entirely proper. For parallel reasons, a *good* human being should love himself and desire to contemplate himself in action (NE IX 9 1169<sup>b</sup>30–1170<sup>a</sup>4).

**The most excellent (*kratiston*) thing:** *Ariston* (“best”), used at 1074<sup>b</sup>33, is the superlative of *agathos* (“good”). *Kratiston*, which is the superlative of *kratus* (“strong”), often has more or less the same meaning as *ariston*, as it does here, but with a nod toward the supreme power and esteem of the divine understanding.

**And the active understanding is active understanding of active understanding (*hê noêsis noêseôs noêsis*):** The divine understanding (= the primary god) is thus apparently a form of reflexive conscious awareness—active reflexive awareness that is otherwise objectless. From the inside, then, from the point of view of the subject experiencing it, it is apparently a state of consciousness of a sort familiar from the writings of the mystics, in which both subject and object merge in an awareness that yet remains fully and truly attentive. Insofar as we have any experience-based evidence of what a beatific state is like, this one is surely a candidate, giving us some reason to credit Aristotle’s glowing description of it (A 7 1072<sup>b</sup>14–28).

#### Note 1388

**In cases where the thing understood has no matter, the active understanding will be one with the thing understood:** See A 7 1072<sup>b</sup>19–21.

#### Note 1389

**For if it were, then the [divine] understanding would undergo change in understanding the parts of the whole (*en tois meresi tou holou*):** That the object of divine understanding is incomposite follows also from the fact that it itself is “without parts and indivisible” (A 7 1073<sup>a</sup>6–7), since it is its own object (1074<sup>b</sup>33–34).

#### Note 1390

**[1] Just as the human understanding [of such things] is, or the understanding even of composite things in a certain time (*en tini chronô[i]*):** O is a composite intelligible object, such as the form or essence of a matter-form compound, whose parts are  $o_1$ ,  $o_2$ , and  $o_3$ . U is a human understanding that at time  $t_1$  has  $o_1$  as its object, at  $t_2$   $o_2$ , and at  $t_3$   $o_3$ . If U’s going through that temporal process is his understanding O as a whole, then that understanding is divisible into a series of stages,

and S undergoes change in understanding O. But Aristotle thinks that this is not what understanding O as a whole consists in: "The states of the understanding part [of the soul] are not alterations, nor is there any coming to be of them. For we must rather say that what knows scientifically is in [the category of] what is related somehow to something. Further, it is evident too that there is no coming to be of them. For what potentially knows scientifically becomes what [actually] knows scientifically not because it has itself moved, but rather because of the presence of something else [namely, the object it is related to]. For when the part comes to be [known], [what knows] somehow scientifically knows the universal [whole] by means of the part. And again, there is no coming to be of the use or activation [of the state], unless we suppose that there is a coming to be of both catching sight and of touching, since the use and activation are similar to these. And the acquisition of scientific knowledge at the start is neither a coming to be nor an alteration, since we are said to know and to understand (*phronein*) as a result of our understanding's having come to rest and being still, and there is no coming to be of being at rest, or indeed of any change (*metabolê*) at all" (*Ph.* VII 3 247<sup>b</sup>1–13). Thus understanding O is like winning a race or touching something (A 7 1072<sup>b</sup>20–21) rather than a process of some sort. So we must think of S and O this way: As a result of successively grasping  $o_1$  at  $t_1$ ,  $o_2$  at  $t_2$ , and  $o_3$  at  $t_3$ , S grasps O as a whole at  $t_4$ : "in the case of understanding and making deductions about immovable objects . . . the end is a theoretical object, for when one understands the two premises, one understands and puts together the conclusion" (*MA* 7 701<sup>a</sup>9–11). The certain time in which S's understanding of O is indivisible, then, is  $t_4$ , the moment at which he grasps O as a whole.

For [2] it does not possess the good in this or that (*ou gar echei to eu en tôdê ê en tôdi*), rather, [3] in a certain whole it possesses the best (*all' en holô tini to ariston*): The closeness of wording between *en tois meresi tou holou* (1075<sup>a</sup>6) and *to eu en tôdê ê en tôdi* and *all' en holô tini* suggests that they should be understood in the same way, and should be translated accordingly. If [2] and [3] support [1], *to eu* in [2] and *to ariston* in [3] must be composite intelligible objects, since [1] is concerned exclusively with such objects. Moreover, they must be the same object, since [2] tells us that understanding does not possess in one way the very thing that [3] tells us it does possess in another way. Earlier, however, *to ariston* refers to the divine understanding (1074<sup>b</sup>20, 1074<sup>b</sup>33) and, within a mere two lines, the phrase *to agathon kai to ariston* (10 1075<sup>a</sup>11–12) has precisely this significance, with *to eu* used as a stylistic variant two lines later (1075<sup>a</sup>14). It seems, then, that both *to eu* and *to ariston* must refer to the divine understanding. But since this understanding has no matter it cannot be composite (1075<sup>a</sup>6). Hence it seems that [2] and [3] cannot support [1] but must instead be treated as making the separate point that the human understanding of an incomposite thing, such as the good or the best, is by contrast with its understanding of a composite one, not a matter of understanding one part and then another until the whole is grasped, but simply a matter of grasping the whole.

[3] Being something else (*on allo ti*): The point made is that the good or best grasped by the human understanding in the way described in [2] is not identical

to the human understanding, but is something else altogether, which marks a contrast with the divine understanding that is the main topic of the passage. This is confirmed by the following text: "It is not in that way [namely, by understanding something else] that the god possesses the good (*eu echei*), rather he is too good to understand anything besides himself, and the reason for this is that while the good (*to eu*) for us has reference to something distinct, in his case he is his own good (*to eu*)" (*EE* VII 12 1245<sup>b</sup>16–19). The divine understanding, which is the primary god, achieves the good by understanding himself; we achieve it, not by reflexive self-understanding, but by understanding him.

Note 1391

**We must also investigate in which way the nature of the whole possesses the good and the best—whether as something separated and intrinsic, or as its order:** A 9 argues that the divine understanding (the primary god) is the best or most excellent thing (1074<sup>b</sup>30–35), and explains how it possesses the good and the best, which is in fact itself (1075<sup>a</sup>6–10). The question now raised is how "the nature of the whole" possesses that best good. Three options are canvassed: (1) the divine understanding is an intrinsic being separated from the nature of the whole; (2) it is the order of that nature; (3) it is both. Although none of these is explicitly identified as the correct answer, a preference is shown for (3). The divine understanding is outside space and time, the universe (A 1 1069<sup>a</sup>19n) is inside it (*Cael.* I 9 279<sup>a</sup>11–28, quoted in A 7 1072<sup>b</sup>30n). So the divine understanding is (1) separated from the nature of the whole. At the same time, as an object of desire its existence is detectable within the universe in the shape of the order that desire induces in it (1075<sup>a</sup>15–25).

**The nature of the whole:** The whole = the universe. Is this nature (1) something beyond the individual natures of the beings that constitute the universe or (2) not something beyond them—as it would be, for example, if it were epiphenomenal on them? The analogy Aristotle draws between the universe and the household (1075<sup>a</sup>19) suggests not only that (1) is correct but also helps explain the appeal of (2). For the order of a household is dependent on the constitution of the city of which it is a part (*Pol.* I 13 1260<sup>a</sup>15–20, quoted in 1075<sup>a</sup>22n(1)). To explain why the members of a household have, for example, a socialized or second nature that suits them for life in an aristocracy rather than an oligarchy, then, we have to appeal to the constitution of the city in which their household is located. For the constitution and its laws are what cause the members of the household to have the second natures they do. But the constitution is the governing body (*politeuma*) (III 6 1278<sup>b</sup>11)—since what sort a constitution is, is determined by the number and nature of its rulers. A kingship, for example, is a monarchical constitution aiming at the common advantage (7 1279<sup>a</sup>32–34). In a way, then, it is the fact that the constitution has such a ruler that explains why its members, including those of its constituent households, have the second natures they do. By parity of reasoning it is the fact that the universe is a kingship (1076<sup>a</sup>4) that explains why the beings that constitute it have the (first) natures that they do (1075<sup>a</sup>22–23). For if we can speak about those natures in the counterfactual way that Aristotle himself does when he says of the primary heaven that "even if it never began moving, all the same it must

have a starting-point from which it would have begun if it had begun moving, and, if it were to come to a stop, from which it would start moving again" (*Cael.* II 2 285<sup>b</sup>6–8), then we can say that those beings would not have had the first natures that they do if they had not been constituents of a universe that is a kingship. It is this step into the counterfactual that allows us to see the truth in (2). For, since the natures of the beings in the universe could not be other than they are, there is a way in which the nature of the universe really is not something beyond them, since if they are the way they are it must be the way that it is. See also Z 2 1028<sup>b</sup>12–13n, A 1 1069<sup>a</sup>19n.

#### Note 1392

**The good of an army . . . is also the general:** Because, in relevant respects, the general is like the architectonic craftsman of the army's end, which is victory in battle (*NE* I 1 1094<sup>a</sup>9), and so, unlike the soldiers ( $\approx$  the handicraftsmen), knows the causes that will bring it about (A 1 981<sup>b</sup>2–6n).

#### Note 1393

**And the order is not such that one thing has no relation to another but rather there is a relation:** Compare the following text, which runs things in the opposite direction: "It is not necessary for even those cities to be inactive that are situated by themselves and have deliberately chosen to live that way, since actions can take place even among their parts. For there are many communities in the parts of the city that have relations with each other. Similarly, this also holds of any individual human being. For otherwise the [primary] god and the entire cosmos could scarcely be in a noble condition, since they have no external actions beyond the [internal] ones that are proper to them" (*Pol.* VII 3 1325<sup>b</sup>23–30).

#### Note 1394

**For all things are jointly ordered in relation to one thing—but it is as in a household:** "Every household is part of a city" (*Pol.* I 13 1260<sup>b</sup>13), which "is prior in nature to the household," since "it is necessary for the whole (*to holon*) to be prior to the part" (I 2 1253<sup>a</sup>18–20). Since "the virtue of a part must be determined by looking to the virtue of the whole," those of the household and its parts must be determined by looking to the city of which it is a part, and its constitution (*politeia*) (I 13 1260<sup>b</sup>14–15). Moreover, the household itself provides a model for one sort of political constitution: "There is a fifth kind (*eidōs*) of kingship, when one person controls all things, just as each nation and each city controls all common matters. It is ordered on the model of household management. For just as household management is a sort of kingship of a household, so this kingship is household management of a city or a nation or several nations" (III 14 1285<sup>b</sup>29–32). Like other constitutions, this one is "a certain order (*taxis*) of those who inhabit a city" (III 1 1274<sup>b</sup>38), and is thus the relevant analogue of the sort of cosmic order referred to throughout 1075<sup>a</sup>11–25—notice *politeuesthai* ("governed") and *koiranos* ("ruler," "king") at 1076<sup>a</sup>3–4. It is to such a constitution, moreover, that the (non-political) constitution of an animal is analogized: "We should consider the constitution (*sunestantai*) of an animal as being like a city well-governed by

laws. For once order (*taxis*) is established in a city, there is no need of a separate monarch to preside over each thing that happens, rather each individual does his own task as the order prescribes, and one thing follows another because of habit. In animals, the same thing happens because of nature, and because each part of them, since they are so constituted, is naturally suited to perform its own function. Hence there is no need of a [separate] soul in each part, but rather, because it is in some starting-point of the body [namely, the heart], the other parts live because they are naturally attached to it, and perform their own function because of nature" (*MA* 10 703<sup>a</sup>29–<sup>b</sup>2).

**Where the free people (*eleutherois*):** A free person is, in the first instance, someone who is not a slave. In this sense the farmer citizens of a democracy are free people. But a farmer has to work in order to get the necessities of life; he is not a man of leisure. Hence, there is another sense in which he is not free. A person free in this second sense has distinctive character traits, education, and outlook. Unlike a slavish or vulgar person, he is not obsessed with practical or useful things (*Pol.* VII 14 1333<sup>b</sup>9–10, VIII 3 1338<sup>b</sup>2–4), but is "the sort of person whose possessions are more noble and purposeless than purposeful and beneficial, since that is more characteristic of self-sufficient people" (*NE* IV 4 1125<sup>a</sup>11–12). Because he is a well-educated person he has a broad perspective on the world, rather than a narrow-minded or overly specialized one. Hence he is able to judge or assess the credibility and appropriateness of discussions belonging to different professions and disciplines in which he is not himself an expert ( $\alpha$  3 995<sup>a</sup>12n). Moreover, he has the virtues of character and thought, and so what appears to be the good to him is what is in fact the best good (*NE* III 4 1113<sup>a</sup>23–<sup>b</sup>2), namely, the sort of theoretical contemplation in which the primary god also engages ( $\Lambda$  6 1072<sup>b</sup>24–25n). Hence he alone has what it takes to be a full citizen in the city with the best sort of constitution: "the one consisting of those who are unconditionally best in accord with virtue, and not those who are good men relative to a hypothesis, is the only constitution that it is just to call an aristocracy. For only in it is it unconditionally the case that the same person is a good man and a good citizen" (*Pol.* IV 7 1293<sup>b</sup>3–6). Since this city ensures that he has the resources needed for leisure (VII 9 1329<sup>a</sup>17–26), he does not need to work for a living, and so does not "live in dependence on" (*Rh.* I 9 1367<sup>a</sup>32–33) or "for the sake of" (*A* 2 982<sup>b</sup>26) another, which is an additional mark of being free. The art and music he enjoys, and the use he makes of his leisure, further distinguish him from those who are crude or uncivilized (*Pol.* VIII 7 1342<sup>a</sup>19–32, VII 15 1334<sup>a</sup>11–40, *Po.* 26 1461<sup>b</sup>26–1462<sup>a</sup>4).

**The free people least of all do things at random, but all or most of the things they do are ordered, while the slaves and beasts can do a little for the common thing, but mostly do things at random:** The most important way in which the constitution of their city determines the behavior of the free people in it is by providing public education that inculcates the kind of virtue that suits them to be citizens of the particular sort of constitution—aristocratic, oligarchic, democratic, or whatever—that their city happens to have. This education is primarily, and often exclusively, provided to males, many of whom will eventually marry

and become heads of households. When they do, one of their primary tasks will be to educate the other members of the household (women, children, and slaves) in the kind of virtue that will complete or perfect their different natures: "For a slave does not have the deliberative part of the soul at all; the female has it but it lacks control; a child has it but it is incomplete. We must take it, therefore, that the same necessarily also holds about the virtues of character, namely, that all must share in them, but not in the same way—instead, each must have a sufficient share to enable him to perform his own function. That is why a ruler must have complete virtue of character. For his function is unconditionally that of an architectonic craftsman, and his reason is an architectonic craftsman. But each of the others must have as much virtue as pertains to them. . . . Since a child is incomplete, it is clear that his virtue too is not his in relation to himself, but in relation to his end and his leader. And the same holds of a slave in relation to his master. But we said that a slave is useful in relation to the necessities, so of virtue too he clearly needs only a little—just so much as will prevent him from being deficient in his functions because of intemperance or cowardice" (*Pol.* I 13 1260<sup>a</sup>12–36).

Moreover, this broadly educative process does not stop with the human members of the household—it extends downward to the domestic animals as well: "Domestic animals are by nature better than wild ones, and it is better for all of them to be ruled by human beings, since this will secure their preservation" (*Pol.* I 5 1254<sup>b</sup>10–13). Their virtues—which suit them to perform household tasks, such as plowing the fields or guarding the henhouse at night—are not far removed, therefore, from those of lower grade slaves.

As we move from one type of political constitution to another, then, the virtues of *all* the members of the household change: "it is necessary to look to the constitution in educating both women and children, if indeed it makes any difference to the excellence of a city that its children be excellent, and its women too" (*Pol.* I 13 1260<sup>b</sup>15–20).

Thus, when the members of a household have had their natures completed or perfected through education and habituation in, for example, an aristocracy, they thereby acquire a specific sort of second nature, which identifies them as members of just such a household, since its constitution, in the shape of the relevant virtues, has been stamped into their souls. In addition to their individual (first) natures, therefore, which differ in all sorts of ways from one another as a result of the natural lottery, human beings, as members of a household and city, also have second natures, which—though different—are sufficiently similar to justify us in speaking of the members of the household as sharing a common second nature.

Because a free male head of household has virtue complete and his free wife something very close to it, their actions are to a very high degree ordered by the constitution, in that almost everything they do is in accord with the complete virtue they possess. A slave, by contrast, since he possesses only a minimal amount of virtue, has his behavior only minimally ordered in this way. His behavior is more random, therefore, than that of his master and mistress. The behavior of domestic animals, more so still.



To *koinon* in a political constitution or household is to *koinon sunpheron*—"the common advantage" or common good (III 7 1279<sup>a</sup>28–29). And its members share in or contribute to this to the degree that they share in living well or happiness (1278<sup>b</sup>20–23), which, as the human good, just is the common advantage. But because happiness is "activity of the soul in accord with virtue" (NE I 7 1098<sup>a</sup>16–17), slaves and animals can "do little toward" this, since they have so small a share of the virtue that doing more would require.

Nonetheless, all the members of the household do contribute to the common advantage to some extent. For even though their first natures differ, the differences are complementary and attuned to one another: "Those who are incapable of existing without each other necessarily form a couple, as female and male do for the sake of procreation (they do not do so from deliberate choice, but, like other animals and plants, because the urge to leave behind something of the same sort as themselves is natural), and as what rules by nature and what is by nature ruled do for the sake of preservation. For if something is capable of looking ahead by using its thought, it is by nature a ruler and by nature a master, whereas whatever can labor by using its body is ruled and is by nature a slave. That is why the same thing is advantageous for both master and slave" (*Pol.* I 2 1252<sup>a</sup>26–34). And because their first natures have this feature, their second natures must be so developed as to preserve and enhance it: "As for man and woman, father and children, the virtue relevant to each of them, what is good in their relationship with one another and what is not good, and how to achieve the good and avoid the bad—it will be necessary to go through all these in connection with the constitutions" (I 13 1260<sup>b</sup>8–13). It is not enough that the members of the household be ordered, in other words, they must be so *jointly* ordered as to fit together well.

The practical science that enables someone to manage a household well is household management, of which mastership of slaves is a part. But a free person will not act as a slave master unless he has to: "There is nothing grand or dignified about this science. . . . That is why for those who have the resources not to bother with such things, a steward takes on this office, while they themselves engage in politics or philosophy" (*Pol.* I 7 1255<sup>b</sup>33–37). But even politics has its downside: "among actions in accord with the virtues, those in politics and war stand out in nobility and magnitude but these are unleisured and seek some end rather than being choiceworthy because of themselves" (NE X 7 1177<sup>b</sup>16–18).

The other end in question is the leisured activity of contemplation or theoretical knowledge that is most like the activity of the primary god (Λ 7 1072<sup>b</sup>14–30). This end is pursued not just by the individual, however, but by the city as a whole and by the household: "Does practical wisdom rule over all the things that are in the soul, as it seems to and as gives rise to puzzles? Surely not. For over the things that are better, such as theoretical wisdom, it would seem not to do so. But it is said that it oversees everything, and has control and is prescriptive. But presumably it is like the steward in the household. For such a person has control over everything and directs everything. But he does not rule over everything, instead he arranges leisure for his master, in order that the latter may not be tied down by necessary

things and turned aside from doing something that is noble and appropriate to him" (*MM* I 34 1198<sup>b</sup>8–17).

The rule of the head of a household, then, is primarily the rule of a final or teleological cause, rather than of an efficient one. And it is because his end is contemplation, which is an intrinsic good, that all the things in the household are jointly ordered in relation to a single thing—one that is "separated and intrinsic," as our text puts it (1075<sup>a</sup>12–13), from the smooth functioning of the household itself and its good and harmonious order.

#### Note 1395

**For this is the sort of starting-point that the nature is of each of them:** Reading *τοιαύτη γὰρ ἐκάστου ἀρχὴ αὐτῶν ἢ φύσις ἐστίν* with Ross and the mss. for OCT *τοιαύτη γὰρ ἀρχὴ ἐκάστου αὐτῶν ἢ φύσις ἐστίν* ("for this is the sort of starting-point of each of them that the nature is").

**The nature** (*hê phusis*): That is, *hê tou holou phusis* (1075<sup>a</sup>11)—"the nature of the whole."

#### Note 1396

**All must at least come to be disaggregated [into their elements]:** The elements into which things are disaggregated contribute to the whole by being "ever active" and imitating "the things that cannot pass away" (Θ 8 1050<sup>b</sup>28–30).

**And similarly there are other things which they all share for [the good of] the whole:** "It is the most natural function in those living things that are complete and not disabled or spontaneously generated, to produce another like itself—an animal producing an animal, a plant a plant—in order that they may partake in the eternal and divine insofar as they can. For all desire that, and it is for the sake of it that they do whatever they do by nature. . . . Since, then, they cannot share in what is eternal and divine by continuous existence, because nothing that admits of passing away can persist as the same and numerically one, they share in them insofar as each can, some more and some less. And what persists is not the thing itself but something like itself, not one in number but one in form" (*DA* II 4 415<sup>a</sup>26–<sup>b</sup>7).

#### Note 1397

**Contraries are impassive with respect to each other:** "Given that there are a limited number of starting-points, there is a reason not to posit two only. For we might be puzzled about how density could be of such a nature as to produce some effect on rarity or rarity on density. And similarly for any other pair of contraries. For love does not gather strife together and produce something from it, nor does strife produce something from it, but rather both act on a third distinct thing" (*Ph.* I 6 189<sup>a</sup>21–26).

#### Note 1398

**This issue is resolved in a reasonable way, by there being a third thing:** Namely, matter.

#### Note 1399

**Others make one of the two contraries matter:** These are Platonists for whom the one and the indefinite dyad are contraries, the latter of which plays the role of matter (*A* 6 988<sup>a</sup>7–14).

**Those who make the unequal matter for the equal:** See N 1 1087<sup>b</sup>4–12, 2 1088<sup>b</sup>30–35, 2 1089<sup>b</sup>4–8, 1091<sup>b</sup>30–32.

**Or the many for the one:** See M 1085<sup>a</sup>9–14, <sup>b</sup>4–6.

Note 1400

**Since the one matter is not the contrary of anything:** Reading ἡ γὰρ ὕλη ἡ μία οὐδενὶ ἐναντίον with Ross and the mss. for OCT ἡ γὰρ ὕλη ἡμῖν οὐδενὶ ἐναντίον.

**The one matter:** The matter that is underlying subject for any pair of opposites.

Note 1401

**All things, outside the one, will participate in the bad, because the bad is itself one of the elements:** The bad = the indefinite dyad (A 6 988<sup>a</sup>14–17).

Note 1402

**Empedocles makes love be the good:** See A 4 985<sup>a</sup>21–29.

Note 1403

**Their being is not the same:** Being = essence (Z 4 1029<sup>b</sup>13–1030<sup>b</sup>13).

Note 1404

**It is absurd, too, for strife to be incapable of passing way, since strife for him is the nature of the bad:** Because in Aristotle's view there is no eternal starting-point of the bad as there is of the good (© 9 1051<sup>a</sup>15–21).

Note 1405

**Anaxagoras makes the good his starting-point as mover, since the understanding moves things:** See A 3 984<sup>b</sup>8–22, 4 985<sup>a</sup>18–21.

Note 1406

**The craft of medicine is in a way health:** See Z 7 1032<sup>b</sup>13–14, A 3 1070<sup>a</sup>29–30.

Note 1407

**It is absurd, too, not to posit a contrary to the good and to the understanding:** Because Anaxagoras was one of those who “make all things from contraries” (1075<sup>a</sup>28), he should have provided a contrary for the good, although if he had, he would have been subject to the criticism brought against Empedocles (1075<sup>b</sup>6–7). Aristotle's own account is given at 1075<sup>b</sup>20–22.

Note 1408

**All those who speak of contraries fail to use contraries:** See A 4 985<sup>a</sup>17–<sup>b</sup>4.

**Unless we reformulate what they say:** See A 4 985<sup>a</sup>4–10, 8 989<sup>a</sup>30–33.

Note 1409

**Why there will always be coming to be, and what the cause of coming to be is, no one says:** See A 6 1072<sup>a</sup>10–18.

Note 1410

**For those who posit two starting-points:** Two contraries, one of which might be assigned the role of matter (1075<sup>a</sup>28, 32).

**There must be another starting-point with more control:** To explain the interaction of the contraries, or of the matter and the form, by being its efficient or moving cause (A 4 1070<sup>b</sup>22–25).

**Control:** See A 1 981<sup>b</sup>11n.

Note 1411

**And for those who posit the Forms there will yet another starting-point with more control:** Reading καὶ τοῖς τὰ εἶδη ἔτι ἄλλη ἀρχὴ κυριωτέρα with Ross for OCT καὶ τοῖς τὰ εἶδη ὅτι ἄλλη ἀρχὴ κυριωτέρα.

**There will yet another starting-point with more control:** That is, another one beyond the efficient cause mentioned in the previous sentence. The reference, as at A 6 1071<sup>b</sup>16–17, is to “the one,” from which, together with the indefinite dyad, the Forms are composed (A 6 987<sup>b</sup>20–22).

Note 1412

**For the others there must be some contrary to theoretical wisdom and the most estimable science:** Again, Aristotle seems to be inferring this from the fact that the thinkers under consideration make everything from contraries. In the case of Plato, he seems to have in mind the following passage (notice *agnoia* at 1075<sup>b</sup>23): “[Socrates] We are adequately assured of this, then, and would remain so, no matter how many ways we examined it: what completely is is completely an object of knowledge, and what is in no way at all is an object of complete ignorance (*agnōstōn*). [Glaucon] Most adequately. [S.] Good. In that case, then, if anything is such as to be and also not to be, wouldn’t it lie in between what purely is and what in no way is? [G.] Yes, in between them. [S.] Then, since knowledge deals with what is, ignorance must deal with what is not, while we must look in between knowledge and ignorance (*agnoias*) for what deals with what lies in between, if there is anything of that sort. [G.] Yes” (*Rep.* V 477a2–b3).

**Theoretical wisdom and the most estimable science:** See A 2 983<sup>a</sup>4–11.

Note 1413

**Nothing is contrary to the primary thing, since all contrary things have matter, and such things are potential:** Contraries differ maximally in the same genus (Iota 4 1055<sup>a</sup>27–28), which is in relevant ways like matter (Z 12 1038<sup>a</sup>6–8). Thus if P is the primary thing and has a contrary, P must have matter. The matter of bodies, however, is potential not active (K 2 1060<sup>a</sup>20–21). But what is active is prior to what is potential (A 6 1071<sup>b</sup>17–22). Therefore P cannot be both the primary thing and have a contrary.

**Primary thing:** See A 2 982<sup>a</sup>25–<sup>b</sup>7, Z 4 1030<sup>a</sup>10–11n.

Note 1414

**The contrary state, ignorance, is directed toward the contrary, but to the primary thing nothing is contrary:** See © 10 1052<sup>a</sup>1–4.

Note 1415

**If beyond the perceptibles there are not going to be any other things at all:** Perceptibles are matter-form compounds, and so, as involving matter, are not

essentially active. Hence, though they may be capable of moving things, they need not be actively doing so (A 6 1071<sup>b</sup>12–22).

**Then there will not be a starting-point:** That is, a true *starting-point* of movement, to which none other is prior, because it is essentially an active mover.

**Order:** Understood as requiring a single teleological starting-point, a single prime mover, rather than many uncoordinated movers (1075<sup>b</sup>16–19).

**Coming to be or celestial movements:** Which as eternal require an eternal, essentially active starting-point (A 6 1072<sup>a</sup>9–18).

**But always a starting-point of the starting-point, as there is for the theologians and all of the physicists:** See A 6 1071<sup>b</sup>26–31.

#### Note 1416

**Since it would admit of not being:** Contrary things have matter, which implies potentiality and contingency (1075<sup>b</sup>22–23), whereas just what is capable of acting on things and capable of moving things must be essentially and intrinsically an activity (A 6 1071<sup>b</sup>17–22).

#### Note 1417

**But again acting [on things] is posterior to capacity:** See A 6 1071<sup>b</sup>22–26.

**Acting (*poiein*) [on things]:** *Poien* also means “to produce,” but here has its broader sense, cognate with that of *poiêtikon* (“what is capable of acting on things”) in the previous sentence, of “acting on something” or “doing something to something.”

**Therefore, one of these must be done away with:** We must give up either the view that acting on things is posterior to being capable of acting on them or the view that being is eternal.

**And we have said how:** See A 6 1072<sup>a</sup>3–18.

#### Note 1418

**Nor is it possible, unless one says it the way we do, to say in what way the mover makes them one:** See H 6, especially 1045<sup>a</sup>20–33.

#### Note 1419

**Those who say that mathematical number is primary, and that in the same way there is again and again some other contiguous substance:** Speusippus is one of these (Z 2 1028<sup>b</sup>20–27).

**Make the substance of the universe:** See A 1 1069<sup>a</sup>19n.

**Episodic:** See A 7 1072<sup>b</sup>30–1073<sup>a</sup>3, N 3 1090<sup>a</sup>19–20.

#### Note 1420

**Beings, however, do not wish (*bouletai*) to be badly governed:** *Bouletai* with subjects not obviously possessed of wish (Θ 7 1049<sup>a</sup>6n) is often best translated as “tends”—as in the phrase *bouletai hê phusis* (GA IV 10 778<sup>a</sup>4–9, and elsewhere). Here, however, the beings are being treated as if they were the citizens of a city ruled by a monarch, and so as things that do have wish. Compare A 7 1072<sup>a</sup>28.

**“To have many rulers is not good; let there be one ruler”:** Reading οὐκ ἀγαθὸν πολυκοιρανίη· εἰς κοίρανος ἔστω with Ross and Homer, *Iliad* II.204, for OCT οὐκ

ἀγαθὸν πολυκοιρανίη· εἰς κοίρανος (“To have many rulers is not good; one ruler”). See also *NE* VIII 10 1161<sup>a</sup>25–27, *Pol.* I 12 1259<sup>b</sup>12–14.

## BOOK MU (XIII)

### Note 1421

**Dealing with matter in the methodical inquiry into natural things:** The precise reference is unclear, but likely candidates are the discussions in *Z* 3–Θ 5 and in *A* 1–5.

**And later with substance as activity:** Θ 6–10 or *A* 6–10.

### Note 1422

**Some posit a single nature for both . . . :** For the identities of the various thinkers mentioned, see *A* 1 1069<sup>a</sup>34–36n.

**We must investigate the objects of mathematics first, without positing any other nature for them:** In *M* 2–3.

### Note 1423

**Then after this we must separately investigate the Ideas themselves:** In *M* 4–5.

**Most of the points have been made also in the external accounts** (*τῶν ἐξωτερικῶν λόγων*): *Exōterikoi logoi* are also mentioned at *Ph.* IV 10 217<sup>b</sup>30, *NE* I 13 1102<sup>a</sup>26, VI 4 1140<sup>a</sup>2, *EE* I 8 1217<sup>b</sup>20, II 1 1218<sup>a</sup>32, *Pol.* III 6 1278<sup>b</sup>30, VII 1 1323<sup>a</sup>21. *Cael.* I 9 279<sup>a</sup>30 mentions “the philosophical works in circulation” and *DA* I 4 407<sup>b</sup>29 “the common accounts.” The references, apparently, are to popular works written by Aristotle himself and “in circulation” (*NE* I 5 1096<sup>a</sup>3) outside the Lyceum, or to accounts or arguments, not necessarily developed by him, that are generally known. Whatever the precise reference here, it must be to accounts with which the audience of the *Metaphysics* could be safely taken to be familiar.

### Note 1424

**When we are investigating whether substances and the starting-points of beings are numbers and ideas:** In *M* 6–9.

### Note 1425

**That it is impossible for the objects of mathematics to exist in perceptibles, and at the same time that the argument for it is bogus, has also been stated in going through the puzzles:** See *B* 2 998<sup>a</sup>7–19 (= part of [P4]).

**The argument for it is fabricated** (*plasmatis*): See *M* 7 1082<sup>b</sup>2–4.

**The other capacities and natures:** That is, the various attributes of things that, unlike the numbers, these thinkers did separate from perceptibles, even though the very same argument showed these attributes to be as immanent in perceptibles as the numbers (*B* 2 998<sup>a</sup>11–13).

### Note 1426

**The immovable solids:** That is, the mathematical as opposed to the perceptible ones.

## Note 1427

**These lines and solids are distinct from those that exist together with (*hama*) the separate solids:** Here, in the next sentence, and at M 2 1077<sup>b</sup>8, the preposition *hama*, which often has a temporal sense (“at the same time”), is without direct reference to time.

## Note 1428

**We get one lot of solids beyond the perceptible ones; three lots of planes beyond the perceptible ones—the ones beyond the perceptible ones, the ones in the mathematical solids, and the ones beyond the ones in those solids; and four lots of lines, and five lots of points:** The four lots of lines are (1) the one in the perceptible plane that is part of the perceptible solid; (2) the one in the mathematical plane that is part of the mathematical solid; (3) the one in the mathematical plane that is not part of but prior to the mathematical solid; (4) the one that is not part of but prior to the mathematical plane, which is not part of but prior to the mathematical solid. There are five lots of points for cognate reasons. The accumulation ends with the separate mathematical points that are not parts of but prior to the separate mathematical line (1076<sup>b</sup>28).

## Note 1429

**How is it possible to resolve the very issues also gone over in the discussion of puzzles?:** See B 2 997<sup>b</sup>12–34 (= part of [P4]).

## Note 1430

**There are certain mathematical propositions (*graphetai*):** *Graphetai* are “things that are drawn,” or diagrams produced in the course of giving a proof (B 3 998<sup>a</sup>25n).

**That are universal and go beyond these substances:** See E 1 1026<sup>a</sup>27n.

## Note 1431

**Here too, then, there will be another intermediate substance separate both from the Ideas and from the intermediates:** See A 6 987<sup>b</sup>15–16n.

**That is neither number nor point nor magnitude nor time:** “That proportionals alternate might be thought to apply to numbers insofar as they are numbers, lines insofar as they are lines, solids insofar as they are solids, and times insofar as they are times, as used to be demonstrated of these separately, although it is possible to prove it of all cases by a single demonstration. But because all these things—numbers, lengths, times, solids—do not constitute a single named [kind] and differ in form from one another, they were treated separately. But now it is demonstrated universally. For what is supposed to hold of them universally does not hold of them insofar as they are lines or insofar as they are numbers, but insofar as they are this [unnamed] kind” (*APo.* I 5 74<sup>a</sup>17–25). Supposed K is the unnamed kind in question, then the argument that leads Platonists to posit numbers as intermediate entities separate from Forms (Ideas) and perceptibles should also lead them to posit K as a new kind of thing separate from Forms, intermediates, and perceptibles. See M 3 1077<sup>b</sup>17–22.

Note 1432

**Incomplete magnitude, while prior in coming to be, is posterior in substance, as the inanimate is to the animate:** Explained at 1077<sup>a</sup>24–<sup>b</sup>11.

Note 1433

**In virtue of what on earth will a mathematical magnitude be one:** Reading *τινι ποτ'* with Bonitz for OCT *τίνι καὶ ποτ'* ("in virtue of what, and when").

Note 1434

**The things that exist here are one in virtue of soul or a part of soul:** When the things in question are animate, the claim is intelligible enough, since the soul of a plant or animal is its form (Z 10 1035<sup>b</sup>14–16), and a form is what gives substantial unity to a matter-form compound, making it in the strong sense one thing (Iota 1 1052<sup>a</sup>22–28). But Aristotle seems to extend the claim beyond these to other, at any rate, naturally unified things.

(1) "The potentiality of all soul seems to be associated with a body different from and more divine than the so-called elements. . . . For within the seed of everything there is present that which makes the seeds be fertile, the so-called hot. This is not fire or that sort of capacity, but the *pneuma* enclosed within the seed and within the foamy part—more precisely, the nature in the *pneuma*, which is analogous to the element that constitutes the stars (= ether)" (GA II 3 736<sup>b</sup>29–737<sup>a</sup>1). Characterized as "connate" (*sumphuton*), because it is not drawn in from outside but generated and maintained inside the body (PA II 2 648<sup>a</sup>36–649<sup>b</sup>8), it is the sort of *pneuma* that plays a fundamental role in nutrition and reproduction (GA II 6 741<sup>b</sup>37–742<sup>a</sup>16). The reproductive system, indeed, is in many ways simply a means of transmitting the form-preserving digestive system (of which blood and the heart are parts) into new matter, thereby initiating the formation of a new self-maintaining creature. That is why both functions are assigned to the *threptikon* or nutritive part of the soul (DA II 4 416<sup>a</sup>19–20, 416<sup>b</sup>11–12).

(2) Although many natural beings (for example, inanimate ones) do not preserve their form by means of nutrition, or transmit it by means of sexual reproduction, *pneuma* has a fundamental role to play in their existence too: "Democritus omitted to mention the for-the-sake-of-which [or final cause], and so thought that all the things that nature uses are due to necessity. And they are. At the same time, however, they are for the sake of something—that is, for the sake of what is in each case better. Thus nothing prevents the teeth from being formed and lost in the way he says, but it does not happen because of these, but because of the end. The [things he cites] are causes in the sense of being movers, instruments, and matter, since it is reasonable, indeed, for nature to make most things using *pneuma* as instrument. For just as some things have many uses where the crafts are concerned—for example, the hammer and the anvil in blacksmithing—so does *pneuma* in those constituted by nature" (GA V 8 789<sup>b</sup>2–12).

(3) Despite its manifest importance, no focused discussion of *pneuma* occurs in Aristotle's extant works. This makes it difficult to determine his views with confidence. But by piecing together what he does say, a reasonably clear picture emerges. From its role in embryology alone, for example, we can see that *pneuma*



transmits movement by being itself in movement. The role accorded to it in animal movement confirms this fact: “[*Pneuma*] is evidently well disposed by nature to impart movement and supply strength. At all events, the functions of movement are pushing and pulling, so that its instrument (*organon*) must be capable of expanding and contracting. And this is just the nature of *pneuma*, since it contracts and expands without constraint, and is able to pull and push for the same reason” (MA 10 703<sup>a</sup>18–23). Moreover, because the movements it imparts are formative, they must be complex and various—able, as geneticists now put it, to *code* for all of an animal’s parts. Since movements are “either in a circle or in a straight line or in a combination of the two” (Ph. VIII 8 261<sup>b</sup>28–29), all the complex movements *pneuma* can produce must be some such combination. What makes this possible is that by actively expanding and contracting, and so pushing and pulling, it can cause not just rectilinear, but also circular movements: “spinning in a circle is a compound of pushing and pulling, since what causes something to spin must be pushing one part of it and pulling another, for it draws one part away from itself and another part toward itself” (Ph. VII 2 244<sup>a</sup>2–4). Hence all movements—rectilinear, circular, or a combination of the two—can be caused by *pneuma* (DA III 10 433<sup>b</sup>25–26).

(4) Initially *pneuma* is assigned a role in the transmission of form to what are uncontroversially animate beings. As ether’s sublunary analogue, however, its role becomes extended to explain other phenomena, such as transparency: “It is not qua water or air that these are transparent, but because there exists in them a certain nature, which is the same in both of them and in the eternal body above” (II 7 418<sup>b</sup>7–9); “what we call transparent is not something special to air, or water, or any other of the bodies usually called transparent, but is a common nature or capacity present in these, and in all other bodies in a greater or lesser degree, and does not exist separately” (Sens. 3 439<sup>a</sup>21–23). Then, because *pneuma* is soul-transmitting, soul is to some extent itself attributed to anything in which *pneuma* is present: “in water *pneuma* is present, and in all *pneuma* there is soul-involving [= formative] heat (*thermotêta psuchikên*), so that in a way all things are full of soul” (GA III 11 762<sup>a</sup>18–21).

(5) When “the capacity of all soul” is associated with “the nature in the *pneuma* that is analogous to the element that constitutes the stars,” then, the point of analogy is that the nature in question is both transparent and—as itself in movement—an appropriate transmitter of soul and life. For the element that constitutes the stars, which is *ether* (*aithêr*) or primary body (*sôma prôton*), is a body “different from and additional to the elemental ones met with here, more divine than, and prior to, all of them” (Cael. I 2 269<sup>a</sup>30–32), and is both transparent and in eternal circular movement (I 3 270<sup>a</sup>12–<sup>b</sup>25). Hence *pneuma* is a “body more divine than the so-called elements,” because it is analogous to ether, which is in fact more divine than they.

**Or a part of soul:** See Z 16 1040<sup>b</sup>10–16.

**Or something else that is reasonable:** Reading ἡ ἅλλα τινὶ εὐλόγῳ with the mss. for OCT ἡ ἅλλα τινὶ εὐλόγῳν (“It is reasonable for the things that exist here to be one in virtue of soul or a part of soul or something else”). In the case of artifacts,

the something else might be being tied or glued together or one of the other things listed in  $\Delta$  6. Alternatively, and perhaps more plausibly, Aristotle may be thinking only of the natural things that exist around here.

Note 1435

**The supposition (*axiōma*) would be beyond our perceptual capacities:** Because no animate lines or planes have been observed anywhere (1077<sup>a</sup>34–35).

Note 1436

**Things would have been seen to be capable of undergoing this:** That is, capable of being composed of lines, planes, or points.

Note 1437

**Those things are prior in substance [to others]:** A's are prior in substance to B's if A's can be without (or separate from) B's, but not B's without A's (Z 1 1028<sup>a</sup>34n).

**Which, when separated, surpass [them] in being:** See Z 3 1029<sup>a</sup>5–6.

**Things are prior in account to those things whose accounts are composed of their accounts:** See  $\Delta$  11 1018<sup>b</sup>34–36, Z 10 1035<sup>b</sup>4–6.

Note 1438

**And these do not apply together:** “These” are the two sorts of priority under discussion. “Do not” means “do not necessarily” or “do not always,” not “never do,” or “necessarily do not.”

Note 1439

**What results from abstraction:** As objects of mathematics do in Aristotle's view (K 3 1061<sup>a</sup>28–<sup>b</sup>3, Z 10 1036<sup>a</sup>12n).

**What results from an addition:** See Z 4 1029<sup>b</sup>22–1030<sup>a</sup>17.

Note 1440

**It is not possible for the objects of mathematics to be in any way (*pou*) separated:** Since the separation under discussion is the sort distinctive of substances, which is not mere spatial separation (Z 1 1028<sup>a</sup>34n), and since the Platonic Forms are “not anywhere (*mède pou*)” (Ph. III 4 203<sup>a</sup>9), the indefinite adverb *pou*, which often means “somewhere,” or “anywhere,” may be being used without reference to place to mean “in any way,” or “somehow.” On the other hand, Aristotle may think—Platonic doctrine to the contrary—that if Forms are indeed particulars, then they must be in some place (N 5 1092<sup>a</sup>17–21).

Note 1441

**Many coincidents, though, belong intrinsically to things:** See B 1 995<sup>b</sup>20n.

**For example, insofar as the animal is female and also insofar as it is male, there are attributes special to it:** See A 1 983<sup>a</sup>3n(6b).

**Attributes special (*idia*) to it:** “A special attribute (*idion*) is one that does not make clear the essence of a thing yet belongs to that thing alone and is predicated convertibly of it. Thus it is a special attribute of a human to be receptive of grammar, since if someone is human he is receptive of grammar, and if he is receptive of grammar he is human” (Top. I 5 102<sup>a</sup>18–22).

## Note 1442

**To the extent that [a science] is concerned with what is prior in account and simpler, to that extent the more exactness it has** (*mallon echei to akribes*): In his focal discussion of *akribēia*, Aristotle makes clear that a science's degree of it is measured along three different dimensions: "One science is more *akribēs* than another, and prior to it, if [1] it is both of the that and the why, and not of the that separately from the why; or if [2] if it is not said of an underlying subject and the other is said of an underlying subject (as, for example, arithmetic is more *akribēs* than harmonics); or if [3] it proceeds from fewer things and the other from some additional posit (as, for example, arithmetic is more *akribēs* than geometry). By from an addition I mean, for example, that a unit is substance without position and a point is substance with position—the latter proceeds from an addition" (*APo.* I 27 87<sup>31</sup>–37). The upshot is thus twofold. First, the most *akribēs* version or formulation of a science is the most explanatory one—the one consisting of demonstrations from starting-points. Second, of two sciences, formulated in the most *akribēs* way, one is more *akribēs* than the other, if it demonstrates facts that the other deals with but does not demonstrate. Because a natural science has to posit sublunary matter in addition to such starting-points, the strictly theoretical sciences (theology, astronomy, and mathematics) are more *akribēs* than any natural science. Hence it is among these that the most *akribēs* one will be found. And it will be the one that explains what the others treat as a fact or undemonstrated posit.

The association of *akribēia* with demonstration from starting-points makes "exact" seem a good translation of it, as does its association with abstraction (mathematics) with what we think of as pure (solid geometry) as opposed to applied sciences (mechanics), and with the idea that the *akribēia* of a science or type of argument depends on its subject matter (*NE* I 3 1094<sup>b</sup>24). As applied to craftsmen and their products, *akribēs* comes closest to meaning "refinement" or "finish" or "sophistication." Applied to perceptual capacities, such as seeing or smelling (*DA* II 9 421<sup>a</sup>10), it means "discriminating." Applied to virtue and nature, it may have more to do with accuracy—hitting a target (*NE* II 5 1106<sup>b</sup>14–15)—as it may when applied to definitions (*VIII* 7 1159<sup>a</sup>3) or distinctions (*II* 9 1107<sup>a</sup>15–16) or units of measurement (*Iota* 1 1053<sup>a</sup>1). *Top.* II 4 111<sup>a</sup>8–9 offers *saphēs* ("perspicuous") as an equivalent: "it is well to replace a word with a better known equivalent, for example, instead of *akribēs* in describing a supposition, *saphēs*."

**This is what simplicity does** (*touto de to haploun estin*): Simplicity is not the same as exactness—the two are contrasted at *E* 1 1025<sup>b</sup>5–7—but greater simplicity in the subject matter of a science permits greater exactness in the science itself.

## Note 1443

**There is more exactness without magnitude than with magnitude, and most without movement:** See *Z* 15 1039<sup>b</sup>30–1040<sup>a</sup>5.

**But if there is movement, there is most with the primary movement:** Greater exactness goes with greater primacy in account (1078<sup>a</sup>9–10). Among types of movement and change, spatial movement is prior, and among spatial movements, circular movement (*A* 6 1071<sup>b</sup>36n).

## Note 1444

**It is clear that the attributes that would have belonged to him even if he were somehow not indivisible can still belong to him without these:** That is, without the ones—humanity and indivisibility—that the arithmetician or geometer consider the human being (who is in fact one and indivisible) in abstraction from.

## Note 1445

**Being is twofold, on the one hand actual, on the other in the material way** (*hulikôs*): Since matter is potentiality (H 1 1042<sup>a</sup>27–28), being in the material way—or in the way that matter is—is being potentially. This is the sort of being that the abstract objects of mathematics have.

## Note 1446

**The good and the noble** (*to kalon*) **are distinct:** The adjective *kalos* is often a term of vague or general commendation (“fine,” “beautiful,” “good”), with different connotations in different contexts: “The contrary of *to kalon* when applied to an animal is *to aischron* [‘ugly in appearance’], but when applied to a house it is *to mochthêron* [‘wretched’] and so *kalon* is homonymous” (*Top.* I 15 106<sup>a</sup>20–22). Even in this general sense, however, *kalos* has a distinctive evaluative coloration suggestive of “order (*taxis*), proportion (*summetria*), and definiteness (*hôrismenon*)” (M 3 1078<sup>b</sup>1), making a term with aesthetic connotation, such as “beauty,” seem a good equivalent: to bear the stamp of happiness someone must have *kallos* as opposed to being “very ugly (*panaischês*)” (NE I 8 1099<sup>b</sup>3–4; also *Pol.* V 9 1309<sup>b</sup>23–25). Moreover just as a thing need not have a purpose in order to be beautiful, a *kalon* thing can be contrasted with a purposeful one: a great-souled person is one “whose possession are more *kalon* and purposeless (*akarpa*) than purposeful and beneficial” (IV 3 1125<sup>a</sup>11–12). At the same time, it seems wrong to associate *kalon* with beauty in general, since to be *kalon* a thing has to be on a certain scale: “greatness of soul requires magnitude, just as *to kallos* (‘nobility of appearance’) requires a large body, whereas small people are elegant and well proportioned but not *kaloi*” (IV 3 1123<sup>b</sup>6–8); “any *kalon* object . . . made up of parts must not only have them properly ordered, but also have a magnitude which is not random. For what is *kalon* consists in magnitude and order (*taxis*)” (*Pa.* 7 1450<sup>b</sup>34–37; also *Pol.* VII 4 1326<sup>a</sup>33–34). It is this requirement that makes “nobility” in its more aesthetic sense a closer equivalent than “beauty.”

**For the good is always found in action:** Despite this bold statement, Aristotle sometimes distinguishes the good from the good doable in action: “What causes movement in every case is the desired object, which is either the good or the apparent good—not every good, however, but the good that is doable in action” (*DA* III 10 433<sup>a</sup>28–29); “Even if there is some single good predicated in common of all intrinsic goods, a separable one that is itself an intrinsic good, it is clear that it would not be doable in action or acquirable by a human being” (NE I 6 1096<sup>b</sup>32–34).

## Note 1447

**We shall speak more notably** (*gnôrimôs*) **about this elsewhere:** No such discussion has come down to us.

## Note 1448

**Where the truth is concerned:** See A 3 983<sup>b</sup>2n.

**They were convinced by the Heraclitean arguments that all perceptible things are always flowing:** See A 6 987<sup>a</sup>32–<sup>b</sup>1.

**Wisdom (*phronêsis*):** See A 1 980<sup>b</sup>21n.

## Note 1449

**The virtues of character:** See Δ 15 1020<sup>b</sup>18–25n.

## Note 1450

**Among the physicists Democritus latched on to this only a little:** “This” is “the form or the essence” (*Ph.* II 2 194<sup>a</sup>20–21) = the what-it-is and its universal definition. See also A 4 985<sup>b</sup>4–20, H 2 1042<sup>b</sup>11–15.

**The Pythagoreans had done this for a few things, whose accounts they connected to numbers—for example, what opportune is, or the just, or marriage:** See A 5 985<sup>b</sup>29–31n, 987<sup>a</sup>20–22.

## Note 1451

**It was reasonable, though, that Socrates was inquiring into the what-it-is. For he was inquiring in order to deduce, and the what-it-is is a starting-point of deductions:** Compare: “Socrates the elder thought that the aim was to know virtue, and he used to inquire what justice is, and what courage is, and each part of [virtue]. And it was reasonable for him to do this. For he thought that all the virtues were sciences, so that to know justice and to be just would happen at the same time. For when we have learned geometry and housebuilding, we are at the same time housebuilders and geometers. This is precisely why he used to inquire about what virtue is, rather than how or from what it arises. And this is what happens in the theoretical sciences. For astronomy or natural science or geometry are nothing other than knowing and contemplating the nature of the things that are the underlying subjects of those sciences, though nothing prevents them from being coincidentally useful to us for many of the necessities of life” (*EE* I 5 1216<sup>b</sup>2–16).

**The what-it-is is a starting-point of deductions:** See A 5 987<sup>a</sup>20n (the what-it-is), 3 983<sup>a</sup>27n (starting-point), 9 990<sup>b</sup>10n (deduction).

## Note 1452

**There was not yet the strength in dialectic that enables people, even separately (*chôris*) from the what-it-is:** The relevant strength in dialectic is presumably the source of the well educatedness that enables someone to appraise purported deductions or demonstrations “separately (*chôris*) from the question of what the truth is, whether thus or otherwise” (*PA* I 1 639<sup>a</sup>14–15).

**To investigate contraries:** Though the remark is clearly of broader application, the relevant contraries are presumably the virtues and vices. The definitions of their what-it-ises or essences, since they serve as starting-points of ethical deductions, would have to be correct in order for the deductions to be true or sound.

**And whether the same science is a science of contraries:** See B 2 996<sup>a</sup>18–21 (= part of [P1]).

Note 1453

**Socrates did not make the universals separable or the definitions:** What Socrates did not make separable were the definienda not the definientia ( $\Delta$  6 1015<sup>b</sup>25–26n).

Note 1454

**And so the result:** 1078<sup>b</sup>34–1079<sup>b</sup>3 = A 9 990<sup>b</sup>2–991<sup>b</sup>8, where relevant notes can be found.

Note 1455

**The forms are (one might almost say) more numerous than the perceptible particulars:** A 9 has “the Forms are pretty much equal in number to—or no fewer than—the things whose causes they were inquiring into” (990<sup>b</sup>4–6).

Note 1456

**For to each particular there corresponds an entity that has the same name and is beyond the substances:** Reading καθ’ ἑκαστόν τε γὰρ ὁμώνυμόν τι ἔστι καὶ παρὰ τὰς οὐσίας as at A 9 990<sup>b</sup>5–6 with Ross. OCT does not add τι.

Note 1457

**Of the ways in which it is shown (*deiknutai*):** *Deiknumen* (“we show”) at 990<sup>b</sup>9.

Note 1458

**From some Forms are also generated of things of which they think (*oiontai*) there are no Forms:** A 9 has “from some Forms are also generated of things of which we think (*oiometha*) there are no Forms” (990<sup>b</sup>4–6).

Note 1459

**Of the most exact (*akribestatoi*) of the arguments:** A 9 has “of the more exact (*akribesteroi*) of the arguments.”

**Some produce Ideas of relatives, of which they say (*phasin*) there is not an intrinsic kind:** A 9 has “some produce Ideas of relatives, of which we say (*phamen*) there is not an intrinsic kind” (990<sup>b</sup>15–17). Similarly, at 1079<sup>a</sup>20 (990<sup>b</sup>23), M 5 1080<sup>a</sup>6 (991<sup>b</sup>7).

Note 1460

**The arguments for the Forms do away with the things whose existence those who accept Forms, prefer (*boulontai*) to the existence of the Ideas:** A 9 has “the arguments for the Forms do away with the things whose existence we, as people who accept Forms, prefer (*boulometha*) to the existence of the Ideas” (990<sup>b</sup>18–19). **It follows that it is not the dyad that is primary but number, that prior to number is the relative, and that this is prior to the intrinsic:** A 9 has “it follows that it is not the dyad that is primary but number, and that the relative is prior to the intrinsic” (990<sup>b</sup>19–21).

Note 1461

**Forms will exist (*esontai*—future middle indicative 3rd pl.):** A 9 has “There will be (*estai*—future middle indicative 3rd sing.) Forms” (990<sup>b</sup>24).

**For the intelligible object is a one not only where substances are concerned but also in the case of non-substances, and there are sciences not only of substance:** A 9 has "for the intelligible object is a one not only where substances are concerned but also in the case of the other things, and there are sciences not only of substance but also of the other things" (990<sup>b</sup>24-27).

Note 1462

**Insofar as it is not said of (*legontai*—3rd pl.) an underlying subject:** A 9 has "insofar as it is not said of (*legetai*—3rd sing.) an underlying subject" (990<sup>b</sup>31).

Note 1463

**Why should the two be one and the same:** Reading τὸ δὴ αὖ ἐν καὶ ταὐτόν with Ross for OCT τὸ δὴ αὖ εἶναι ἐν καὶ ταὐτόν.

**Why should the two be one and the same in the case of the twos that pass away, and in the many eternal twos, rather than in the case of two-itself and some particular two?:** A 9 has "why should the two be one and the same in the case of the twos that pass away, and in those that are many but eternal, rather than in the case of [two-] itself and some particular [two]?" (991<sup>a</sup>3-5).

Note 1464

**But if we are to posit that in other respects the common accounts apply to the Forms—for example, that plane figure and the rest of the parts of the account apply to the circle-itself, but the what-it-is (*to ho estin*) must be added:** "[Socrates] What about the couch-maker? Didn't you just say that he does not make the form—which we say is 'the what a couch is' (*ho estin klinē*)—but only a particular couch?" (Plato, *Rep.* X 597a1-2). If A is the account or definition of (the substance or essence of) a Form E, and  $a_1 \dots a_n$  are A's parts, the Platonic instruction is to add to A or to  $a_1 \dots a_n$ , the what-it-is, so that we get, the what A is, the what  $a_1$  is  $\dots$  the what  $a_n$  is.

**We must investigate whether this is not entirely empty (*kenon*):** See B 2 997<sup>b</sup>5-12.

Note 1465

**So-and-so-itself (*auto ti*) must—like the plane—be some sort of nature that will be present in all the Ideas as their genus:** *Auto ti* is a generalization of man-itself, animal-itself, and so on. It is thus a nature present in all the Forms as their genus in the way that the plane is present in all plane figures (triangles, circles, and so on) as their genus.

Note 1466

**Above all, though, we might go through the puzzles of what on earth the Forms contribute (*sumballontai*—present middle passive indicative 3rd pl.) to perceptibles:** 1079<sup>b</sup>12-1080<sup>a</sup>8 = A 9 991<sup>a</sup>8-<sup>b</sup>9, where relevant notes can be found. A 9 has "what on earth the Forms contribute (*sumballetai*—present middle passive indicative 3rd sing.)" (991<sup>a</sup>9).

Note 1467

**It is one that first Anaxagoras and later Eudoxus stated (in going through the puzzles), and also certain others:** A 9 has “it is one that first Anaxagoras and later Eudoxus and certain others stated” (991<sup>a</sup>16–18).

Note 1468

**It is possible for anything both to be and come to be without being copied from something:** A 9 has “It is possible for anything both to be like and become like (*homoiou*) another thing without being copied from it” (991<sup>a</sup>23–25).

Note 1469

**The Forms will be paradigms not only of the perceptibles but also of themselves—for example, the genus, as genus of the several species:** See A 9 991<sup>a</sup>30–31n.

**As genus of the (*tôn*) several species:** A 9 has “as genus of several species” (991<sup>a</sup>31).

Note 1470

**In the *Phaedo*, however, it is said in this way (*touton legetai ton tropon*):** A 9 has “In the *Phaedo*, however, it is said as follows (*houtô legetai*)” (991<sup>b</sup>3).

Note 1471

**Even if the Forms do exist, things would still not come to be unless there was a moving cause:** A 9 has “even if the Forms do exist, the things that participate in them (*ta metechonta*) would still not come to be unless there was a moving cause” (991<sup>b</sup>4–5).

Note 1472

**It is also possible for the things of which they say there are Forms both to be and to come to be through the same causes as the things we mentioned just now, and not because of the Forms:** A 9 has “it is also possible for the others to be and to come to be through the same causes as the things we mentioned just now” (991<sup>b</sup>7–9).

Note 1473

**Where the Ideas are concerned it is possible, both in this way and by more logico-linguistic and more exact (*akribesterôn*) arguments, to collect many objections like those we considered:** Arguing in a logico-linguistic way is associated with Platonists (Z 4 1029<sup>b</sup>13n); Thrasy Machus offers Socrates “an exact argument (*akribê logon*),” since the latter is *akribologês[i]*, “a stickler for exact argument.” The verb *akribologeisthai* often carries the negative connotation of quibbling or hair-splitting. On *akribeia* more generally, see M 3 1078<sup>a</sup>10n.

**More exact (*akribesterôn*) arguments:** See A 9 990<sup>b</sup>15n.

Note 1474

**Any unit is non-combinable (*asumblêtos*) with any other unit:** A is *sumblêtos* (“combinable”) with B if and only if A is capable of entering into arithmetical relations with B.



## Note 1475

**These sorts of numbers must either be separable from things or not separable but in perceptibles (not, however, in the way we first investigated):** At M 2 1076<sup>a</sup>38–<sup>b</sup>11.

## Note 1476

**Some say that both sorts of numbers exist, the sort with a before and after being Forms, and mathematical number being beyond the Ideas and the perceptibles, and both being separable from the perceptibles:** Plato and his orthodox followers (A 6 987<sup>b</sup>14–18).

## Note 1477

**Others, though, say that only mathematical number exists, and is the first of beings, separate from the perceptibles:** Speusippus (Z 2 1028<sup>b</sup>21–24, A 1 1069<sup>a</sup>36n).

## Note 1478

**The Pythagoreans construct the whole heaven from numbers, except not numbers composed of units, since they take the units to have magnitude:** See A 5 985<sup>b</sup>26–986<sup>a</sup>3.

## Note 1479

**How the first one was composed so as to have magnitude they seem at a loss to say:** See N 3 1091<sup>a</sup>15–18.

## Note 1480

**Another thinker says that the first sort of number, Forms, alone exists:** The identity of this thinker has not been established.

**Some say that mathematical number is the same as this:** Probably, Xenocrates (A 1 1069<sup>a</sup>35n).

## Note 1481

**Some people think that those that are the objects of mathematics and those that come after the Forms are distinct:** Namely, Plato (A 9 992<sup>b</sup>13–18).

## Note 1482

**Those who do not make the Ideas numbers or say that the Ideas exist:** Speusippus and the Pythagoreans (as at 1080<sup>a</sup>14).

**Others speak of the mathematical numbers but not in a mathematical way, since they say that not every spatial magnitude is divisible into magnitudes:** Xenocrates (as at 1080<sup>a</sup>22), but also Plato, whose indivisible lines are a case in point (A 9 992<sup>a</sup>20–22). As a result these thinkers deny a starting-point of mathematics. In this regard they are quite different from those who raise puzzles or paralogisms proper to mathematics, because they are based on its starting-points. Hippocrates' argument for squaring the circle by means of lunes, for example, is a geometrical paralogism, because it "proceeds from starting-points proper to geometry" and "cannot be adapted to any subject except geometry" (SE 11 172<sup>a</sup>4–5), whereas someone who gives Antiphon's argument for squaring the circle, which assumes that a circle is a polygon with a large but finite number of sides, violates the geometrical

starting-point or principle that space is infinitely divisible. As a result he produces a sophistical refutation, since his argument is not proper to geometry but “*koinos* (common)” (172<sup>a</sup>8–9). Dealing with him, as a result, is a job for dialecticians: “It is dialecticians who get a theoretical grasp on a refutation that depends on common beliefs, that is to say, that do not belong to any [specialized] craft” (9 170<sup>a</sup>38–39).

Note 1483

**The Pythagoreans take units to have magnitude, as was said earlier:** At 1080<sup>b</sup>19.

Note 1484

**We must investigate whether the units are combinable or non-combinable, and if non-combinable, in which of the ways we distinguished:** At M 6 1080<sup>a</sup>18–20, 1080<sup>a</sup>23–35.

Note 1485

**And the starting-points and elements are said to be starting-points and elements of number:** Reading καὶ αἱ ἀρχαὶ καὶ τὰ στοιχεῖα λέγονται τοῦ ἀριθμοῦ εἶναι with Ross for OCT καὶ αὗται αἱ ἀρχαὶ καὶ τὰ στοιχεῖα λέγονται τοῦ ἀριθμοῦ εἶναι (“and the starting-points of the Ideas are said to be also the elements of number”). The argument, apparently, is this: (1) The one and the indefinite dyad are starting-points and elements of number. (2) The Ideas are either (a) = the numbers or (b) prior or posterior to them. (3) The Ideas ≠ the numbers (1080<sup>a</sup>7). (4) Therefore the Ideas must be prior or posterior to the numbers. (5) But the one and the indefinite dyad are also starting-points and elements of the Ideas (A 6 987<sup>b</sup>20–21). (6) Things with all and only the same starting-points and elements cannot be prior or posterior to one another. (7) Therefore the Ideas cannot be ranked in priority with respect to the numbers.

Note 1486

**The units in the two are generated at the same time:** With mathematical numbers it makes sense to think of generating the numbers by successively adding one unit to the initial one. But the Form numbers are not composed of combinable units. Thus the units in the Form number two are not (logically) prior to it, but (logically) simultaneous with it, or at the same time as it. Hence we cannot make sense of its being the *first* number to come from the Form number one and the indefinite dyad. **Whether as the first person [to introduce Forms] said:** Namely, Plato (M 9 1086<sup>a</sup>11–13, N 3 1090<sup>b</sup>32–33).

**When the unequals have been equalized, or in some other way:** See M 8 1083<sup>b</sup>23–25, N 4 1091<sup>a</sup>24–25.

Note 1487

**Besides, if one unit is to be prior to the other:** Reading ἔπειτα εἰ ἔσται ἡ ἑτέρα μονὰς τῆς ἑτέρας προτέρα with Annas and the ms. for OCT ἐπεὶ εἰ ἔσται ἡ ἑτέρα μονὰς τῆς ἑτέρας προτέρα (“since, if one unit is to be prior to the other”). The effect of the OCT reading is to transform two separate arguments into a single one. **If one unit is to be prior to the other, it will also be prior to the two composed of these:** If the units in the Form numbers do constitute a successive series (as 1081<sup>a</sup>21–25 in effect denied), the Form number two will again not be the first

Form number to come from the one and the indefinite dyad, since the first unit in the Form number two will be prior to it—as the next sentence claims.

#### Note 1488

**For whenever one thing is prior and another posterior, a thing composed of both of them will be prior to the latter and posterior to the former:** If A is composed of B and C, and B is prior to C and C posterior to B, then (1) A is prior to C and (2) A is posterior to B. (2) is clear enough, but (1) is less so. The idea is this. (3) A cannot be simultaneous with C, since nothing can be simultaneous with a thing, such as A, that has parts, such as B and C, that are non-simultaneous. (4) A cannot be posterior to C, since if it were C would be prior to A, and so to B (of which A is composed), contrary to (2). (5) From (3) and (4) it follows that (1) A is prior to C.

#### Note 1489

**There will be a third unit in two before three exists, and a fourth in three, and a fifth, before these numbers exist:** The number one maps onto ( $\rightarrow$ ) the unit one: (1)  $N_1 \rightarrow U_1$ . (2)  $N_2 \rightarrow U_2 + U_3$ . Thus at (2) we already have three units ( $U_1, U_2, U_3$ ), but  $N_3$  had yet to be constructed.

#### Note 1490

**These thinkers make a first unit, and a first one, but not a second and a third, and a first two, but not a second and a third:** At (1) we have one unit  $U_1$  and one number one  $N_{1,1}$ , which maps onto it:  $N_{1,1} \rightarrow U_1$ . At (2) we should therefore have two units  $U_2$  and  $U_3$ , and two new number ones  $N_{1,2}$  and  $N_{1,3}$ , which map onto them:  $N_{1,2} \rightarrow U_2$  and  $N_{1,3} \rightarrow U_3$ . And so on.

#### Note 1491

**[On their view] four comes from the first two and the indefinite dyad—two twos beyond the two-itself:** On Plato's view the Forms are produced by the one and the indefinite dyad. So the Form numbers are so produced. The mathematical numbers, in turn, are produced from the Form numbers. Thus four, for example, is produced from the first two (that is, the Form number two) and the dyad by a process of doubling. It is the two twos thus produced to which Aristotle refers. If one of these twos is the two-itself, then two will be composed of the one-itself and another one. But then the other element in it cannot be the indefinite dyad, since the latter produces not one unit (as required), but a definite two, since it makes two of whatever it is given (1082<sup>a</sup>14–15).

#### Note 1492

**The units in different numbers are differentiated, and only those in the same number are undifferentiated from each other:** The view is Plato's and receives the most extensive discussion [3a–j].

#### Note 1493

**Since the ten-itself is not some random number or composed of any random fives (or of any random units either), the units in this ten must differ:** (1) The ten-itself is a unique Form number; there is no other ten present in it (1082<sup>a</sup>10–11).

(2) So the numbers making it up (for example, the fives) must also be unique. (3) The units in those fives must differ, otherwise the fives will not differ. (4) But there are many more ways than two to divide ten distinct units into groups of five. (5) The supposedly unique fives cannot be unique, nor can the ten they compose. (6) The ten-itself cannot be unique.

Note 1494

**Either [1] by one thing's participating in the other:** Reading μετέξει θατέρου θατέρου with Ross for OCT μετέξει θατέρου θάτερον ("one will participate in the other").

**Or else [2] one is some differentia of the other:** See Z 12 1037<sup>b</sup>13–21. The implicit conclusion is that neither [1] nor [2] is possible in the case of the Form numbers and the units that compose them. For one of the units in two does not [1] participate in the other, so that together they compose a coincidental unity (for the two is an intrinsic unity), but nor [2] is one a differentia of the other, so that the two compose one intrinsic unity, since the two is essentially composed of two units not one.

Note 1495

**If the first two is an Idea:** Reading εἰ καὶ ἡ πρώτη δυὰς ἰδέα with Ross and Annas for OCT εἰ καὶ ἡ πρώτη δυὰς ἰδέαι.

Note 1496

**What cause will someone have for saying that numbers are undifferentiated if not on the grounds of their equality?:** See M 8 1083<sup>a</sup>1–17.

Note 1497

**If every unit plus another unit makes two, a unit from the two-itself and a unit from the three-itself will make a two, which will thus be composed of differentiated units, and so will it be prior to the three or posterior?:** The first two  $N_{2,1}$  comes from the units  $U_2$  and  $U_3$ , so that  $N_{2,1} \rightarrow U_2 + U_3$ . Similarly the number three  $N_3$  comes from  $U_4$ ,  $U_5$ ,  $U_6$ , so that  $N_3 \rightarrow U_4 + U_5 + U_6$ . Now consider the second number two  $N_{2,2}$ , which comes from  $U_2$  and  $U_4$ , so that  $N_{2,2} \rightarrow U_2 + U_4$ . Is  $N_{2,2}$  prior to  $N_3$  or posterior to it? It cannot be posterior, because if it were  $U_2$  would have to be posterior to  $U_4$ , since  $N_3$  and its units are posterior to  $N_2$  and its units.  $N_{2,2}$  can, however, be prior to  $N_3$ , since  $U_2$  is prior to  $N_3$  and there is nothing to prevent  $U_4$  from being so.

Note 1498

**If the three-itself is larger than the two-itself, it is clear that there is a number in it equal to the two, and thus is undifferentiated from the two-itself:** The two-itself, which is a Form or Idea, is supposed to be the first two. But if the three-itself is greater than it (and how could it not be?), the two-itself will not be the first two, since there will be a two in the three-itself that is equal to (and so identical to) the two-itself.

Note 1499

**Those people are correct who say that the units must be different if there are to be Ideas—as was said before:** At 1081<sup>a</sup>5–17 (= [1]).

## Note 1500

**The Form is one, whereas if the units are not different, the twos and threes will also be undifferentiated:** If Forms are (Form-) numbers, each must be unique, so that the units constituting one of them must be different from those constituting another.

## Note 1501

**For they do away with too many things—although they will say that this question itself involves a puzzle, namely, whether, when we count and say “one, two, three,” we count by addition or by separate parts:** (1) Counting by addition is counting by adding one to the preceding number. (2) Counting by separate parts seems to be counting by putting the things to be counted (the separate parts) into one-to-one correspondence with the natural numbers. (1) immediately leads to combinable units, whereas (2) seems not to do so, since it suggests that it is the things counted not the numbers themselves or the units in them that are combinable. Witness the following somewhat obscure exchange: “[Socrates] Moreover, it occurs to me, now that the subject of mathematical calculation has been mentioned, how refined it is, and in how many ways it is useful for our purposes, provided you practice it for the sake of knowledge rather than trade. [Glaucon] Which ways? [S.] Why, in the very one we were talking about just now. It gives the soul a strong lead upward and compels it to discuss the numbers themselves, never permitting anyone to propose for discussion numbers attached to visible or tangible bodies. I mean, you surely know what people who are clever in these matters are like. If, in the course of the argument, someone tries to divide the number one itself, they laugh and won’t permit it. If *you* divide it, they multiply it, taking care that the number one never appears to be not one but many parts. [G.] That’s very true. [S.] Then what do you think would happen, Glaucon, if someone were to ask them: ‘What kind of numbers are you wonderful fellows discussing, where the number one is as you assume it to be, wholly equal in each and every case, without the least difference, and having no internal parts?’ What do you think they would answer? [G.] I think they would answer that they are talking about those that are accessible only to thought and can be grasped in no other way” (Plato, *Rep.* VII 525c8–526a7).

## Note 1502

**We do it in both ways, which is why it is ridiculous that this difficulty should lead to so great a difference of substance:** Counting by addition and by separate parts are equivalent ways of doing the same thing. So they cannot provide a basis for a difference as substantial as that between Form numbers (composed of non-combinable units) and ordinary mathematical numbers (composed of combinable ones).

## Note 1503

**Neither of these seem to admit of belonging to units:** Reading τούτων δ’ οὐδέτερον φαίνεται ἐνδέχασθαι ὑπάρχειν with Ross for OCT τούτων δ’ οὐδέτερον φαίνεται ἐνδέχασθαι ὑπάρχον.

Note 1504

**Units cannot differ in quality either, since no affection (*pathos*) can belong to them:** “Nothing divisible can belong in something indivisible, and the affections are all divisible” (*Cael.* III 1 299<sup>a</sup>19–20).

**For they say (*phasin*) that to numbers too quality (*to poion*) belongs posterior to quantity:** Aristotle himself thinks that certain qualities belong to numbers—such as being square or oblong or solid ( $\Delta$  14 1020<sup>b</sup>1–8). But these are consequent upon or posterior to their quantitative attributes. For example, a number is—or is representable as—a solid because it has three prime factors. It may be, then, that Aristotle is reporting his own view, so that *phasin* (present indicative 3rd pl.) means “they say” in the sense in which it is equivalent in meaning to “it is said.” Alternatively, he may be reporting a Platonist view ( $\Lambda$  1 1069<sup>a</sup>20–21), so that *phasin* should be understood as “these thinkers say.”

Note 1505

**If in fact units differ in some other way, they should state this at the start especially, and determine the differentia of a unit, and especially why it must belong [to units]:** If units are not differentiated in quality or quantity, there will be two tasks that must be addressed (1) to say what the new differentia is and (2) to explain how, since a differentia is an essential attribute, it belongs of necessity to units.

Note 1506

**If indeed the Ideas are numbers, the units cannot be non-combinable with each other in either of the two ways:** See  $M$  6 1080<sup>a</sup>18–20 (= [1b]), 23–35 (= [1c]). This concludes the discussion of Plato in particular.

Note 1507

**These are the ones who think that Ideas do not exist, whether unconditionally or as being certain numbers, but that the objects of mathematics do exist:** The reference is to Speusippus ( $\Lambda$  1 1069<sup>a</sup>34–36n,  $M$  1 1076<sup>a</sup>20–21).

Note 1508

**It is absurd for there to be, as they say, a one that is primary among the ones, but not a two among the twos:** If the numbers are primary among the beings they must all be substantial unities. If they are substantial unities, each of them, and not just the one-itself, must have a formal element that is responsible for that unity. So there must also be a two-itself, and so on.

Note 1509

**If we posit that the numbers as Plato describes them, many impossible results follow, as we have said:** At  $M$  7–8 1080<sup>b</sup>37–1083<sup>a</sup>17.

Note 1510

**The third version is the worst:** The version of Xenocrates. Aristotle omits the unknown thinker who says that only Form numbers exist ( $M$  6 1080<sup>b</sup>21–22).

Note 1511

**Special hypotheses must be posited to keep the view going:** See  $N$  3 1090<sup>b</sup>29–30.

## Note 1512

**They apply their speculations (*theôrêmata*) to bodies:** A *theôrêma* is an object of contemplation (NE IX 4 1066<sup>a</sup>26). *Theôrêmata* (plural) are theoretical views or speculations (Somn. 2 455<sup>a</sup>25, Mete. I 8 345<sup>b</sup>2). The *theôrêmata* referred to here are examples of the "mathematical speculations (*mathêmatikôn theôrêmatôn*)" mentioned at N 6 1093<sup>b</sup>15.

## Note 1513

**If, therefore, it is necessary, if indeed number is an intrinsic being, for it to exist in one of the aforementioned ways:** At M 6 1080<sup>a</sup>15-<sup>b</sup>36 (= [1a-c], [2]).

## Note 1514

[a1-a24]: A series of arguments, ending at M 9 1086<sup>a</sup>21, that are directed against theories of numbers as separable intrinsic beings, but are not clearly connected to what precedes or succeeds them. They fall into five groups:

Group I [a1-3] concern how number is produced from the material starting-point (the indefinite dyad).

Group II [a4-12] concern how many Form numbers there are.

Group III [a13-16] concern the nature of the one.

Group IV [a17-19] concern the starting-points of geometrical objects.

Group V [a20-24] concern the difficulty of generating numbers from the one and multiplicity, or spatial magnitudes from similar starting-points.

**Is each unit composed of the great and the small when they are equalized, or one of the small, another of the great?** The great and the small (= the indefinite dyad) is equalized by the One, thereby generating all the beings, including the units (A 6 987<sup>b</sup>18-27). As characterized by Aristotle, Plato's "the great and the small" (or "the great and small") was supposed to be in some sense one thing (N 1 1087<sup>b</sup>9-16). Here he is inquiring into the mode of combination of the dyad, asking how the great and the small can at once constitute it as a single nature (suggesting that it is a unit) and at the same time as a two-maker—a starting-point of multiplicity (1083<sup>b</sup>35-36).

## Note 1515

**How about the units in the three-itself? For one is odd man out (*perittê*). But perhaps it is because of this that they make the one-itself the middle place in the odd numbers (*perittô[i]*):** Platonists, like Pythagoreans, represented numbers by groups of dots or pebbles. Since it is the addition of one pebble to an even-membered group that makes it odd, the one-itself is identified with the odd (1084<sup>a</sup>36), and is assigned the middle place in a representation of an odd number, flanked by columns of paired off dots or pebbles, representing the even number to which the one is added. Aristotle's question is about how the odd-making one in the three itself is produced if it has to come from both the one and the great and the small. For the great and the small, as the dyad, is a two-maker of what it receives (M 7 1082<sup>a</sup>14-15), and so cannot generate the relevant one, making it an odd man out.

Note 1516

**If each of its units is composed of both the great and the small equalized, how will the dyad, which is one nature, be composed of them? Or how will it differ from the unit?:** The two-itself is the first number generated by the indefinite dyad and the one. Unlike the mathematical, or intermediate, two it is supposedly unique (A 6 987<sup>b</sup>14–18). The second question is how does the two-itself differ from the first *unit* generated by the indefinite dyad and the one. The first question is in effect sharpened by the second, since if the relationship between the two-itself and its constituent units is unclear, its mode of combination must be unclear too.

Note 1517

**The unit is prior to the dyad (*hê duas*):** For the dyad must have a dual nature in order to be a two-maker. Notice that this is a different point than the one made later (1084<sup>b</sup>29) in the same terms—*hê duas* can refer, as here, to the indefinite dyad, as there, to the Form number two, or to the mathematical number two. Context usually makes clear which is under discussion.

**Since, when it is done away with, the two is done away with:** See Z 1 1028<sup>a</sup>31–34n.

Note 1518

**The indefinite dyad (*hê aoristos duas*) is a two-maker:** With N 1 1088<sup>a</sup>15–16, 3 1091<sup>a</sup>5, one of the few passages definitely relating to Plato in which Aristotle uses the term *hê aoristos duas* to characterize the great and small.

Note 1519

**Number must be either limited or unlimited.** For these thinkers make the numbers separable, so that it is not possible for neither of these to belong to them: If the numbers are separable, they are substances (Z 1 1028<sup>a</sup>34n), if they are substances, there must be some definite number N of them, which, because of its mode of generation, must be odd or even. So N cannot be unlimited, since an unlimited number is neither odd nor even. But there are (potentially, at any rate) an unlimited number of numbers. The implicit conclusion is that the numbers cannot be separable.

Note 1520

**The generation of numbers is always of an odd number or of an even one—in one way, when the one applies to an even number, an odd number is produced:** In this case the mode of application is addition.

**In another way when the two applies, the numbers got from the one by doubling are produced:** In this case it is multiplication of the one by the two resulting in a power of two.

**In another way, when the odd numbers apply, the other even numbers are:** Again the mode of application is multiplication, this time of an even number by an odd number, resulting in an even number that is not a power of two.

Note 1521

**Yet this is not possible either in accord with their hypothesis:** An Idea is a one or a unity, with a definite number of internal divisions into sub-Ideas, that imposes



order or limit on the unlimited, and so cannot itself be unlimited: “We have to assume that there is in each case always one Idea for every one of them, and we must search for it, as we will indeed find it there. And once we have grasped it, we must look for two, as the case would have it, or if not, for three or for some other number. And we must treat every one of those further unities in the same way, until it is not only established of the original unity that it is one, many, and unlimited, but also how many it contains. For we must not grant the Idea of the unlimited to the plurality before we know the exact number of every plurality that lies between the unlimited and the one. Only then is it permitted to release each unity into the unlimited and let it go” (Plato, *Phlb.* 16c10–e2).

**Or in accord with reason:** Because in Aristotle’s view there cannot be an actually unlimited number or magnitude but only a potentially unlimited one (a 2 994<sup>b</sup>26–27n).

**They do, though, arrange the Ideas this way (*houtô*):** The reference of the indefinite adverb *houtô* is not entirely clear, but is presumable to 1084<sup>a</sup>6–7: they assign each Idea a definite number and an (indefinite) range of application.

Note 1522

**Not only the that but the why should be stated:** See A 1 981<sup>a</sup>28–30n.

Note 1523

**It is clear that if it is in this way that the three is man-itself, then the other threes are also (since those in the same numbers are similar), so that there will be an unlimited number of men:** Of number that is a given thing-itself, suppose that three is man-itself. The units in it are similar to those in any other three (such as the threes there are in nine). Since there are unlimitedly many such threes, it will follow that there are unlimitedly many men.

**If each three is an Idea, each will be man-itself:** Man-itself is a unique form or idea (A 6 987<sup>b</sup>14–18). But since all the threes are similar, how can it be?

**If not, they will all be men at least:** If it is responded that only one three is an Idea, so that man-itself, as an Idea, must be that one, it can be replied that all the other threes will at least be men of some sort, so that, again, there will be an unlimited number of *them*.

Note 1524

**There both are and come to be things of which there are no Forms:** Aristotle has already argued for this (M 4 1079<sup>a</sup>7–13). It may be, though, that he is here deriving it in a different way, namely, as a consequence of the identification of the Forms with the numbers only up to ten (1084<sup>a</sup>12–13). This would make it fit better into the sequence of arguments he is developing, and to which he returns in [a11].

**It follows that the Forms are not causes:** As they are supposed to be (M 5 1080<sup>a</sup>2–8).

Note 1525

**It is absurd if the number series up to ten is a being and a Form to a higher degree than the ten-itself, even though there is no generation of it as one thing, whereas of the latter there is:** Probably best regarded as a challenge to the privileged status accorded to the decad as consisting of all and only numbers that are

identical to Forms (1084<sup>a</sup>12–13). To have such a Form-determining function, the decad would apparently have to be a sort of Form of a Form (1083<sup>b</sup>24)—prior to the Forms and responsible for their status as Forms. Yet, unlike the ten-itself, it is not one—not unified—in the way a substance or substantial Form must be. How, then, can it confer such unity on anything else?

Note 1526

**They generate the derivative things—for example, the void, proportion, the odd, and other things of this sort—within the decad:** Perhaps in a way similar to the Pythagoreans (A 5 986<sup>e</sup>21n).

Note 1527

**That is why the odd is identified with the one, since if it was in the three, how could the five be odd?:** The one together with the indefinite dyad are what generate the Form numbers. The three is the Form number three, which is not a Form number generator. The only way it could make the Form number five odd is by being present in it. But one Form number is not part of another, since the units in one are non-combinable with the units in another (M 7 option [3]).

Note 1528

**There is the first, the indivisible, line:** See A 9 992<sup>a</sup>20–22.

**Then two:** Z 11 1036<sup>b</sup>14, H 3 1043<sup>a</sup>33–34, N 3 1090<sup>b</sup>22–24.

**Then the rest up to ten:** 1 (indivisible line) + 2 (the divisible or extended line) + 3 (the plane) + 4 (the solid) = 10. Confirming the special status of the decad.

Note 1529

**Insofar, then, as [1] the number (*ho arithmos*) is composite, the one is prior, but insofar as the universal and the form is prior, [2] the number (*ho arithmos*) is prior:** In [1] *ho arithmos* is a singular term referring to a matter-form compound; in [2] *ho arithmos* is a generic noun phrase referring to a universal form (numerosity or plurality), which is the formal element (units being the material one) of the matter-form compound referred to in [1] (Δ 9 1018<sup>a</sup>1–2n). If [2] the universal is prior, then the two—as the first thing to exhibit numerosity or plurality (M 9 1085<sup>b</sup>10)—seems to be prior to the one. But if [1] is prior, then the one, as the simplest thing from which a composite number is composed, would seem to be prior (1084<sup>b</sup>27–29).

Note 1530

**As regards the form and the substance that is in accord with the account, the right angle, and the whole composed of the matter and the form, are prior:** See Z 10 1034<sup>b</sup>28–32.

Note 1531

**What is both is closer to the form and to what the account is of:** See Z 10 1035<sup>a</sup>13–14. **Though posterior in coming to be:** See Θ 8 1050<sup>a</sup>4–7, M 2 1077<sup>a</sup>26–28.

Note 1532

**In one way the one is a starting-point as form or substance, but in the other it is as part or as matter:** The one is in general the formal component of a number

generated from it and the indefinite dyad (A 6 987<sup>b</sup>20–21). But the dyad, if it is to be a two-maker, must itself be in some way two, so that its constituent units are each one, thereby making the one also a part of the material starting-point.

#### Note 1533

**It is only in a way that each of the two (*hekateron*) is one:** That is, each of the two starting-points—the formal and the material.

**In truth it is potentially (if, at any rate, the number is one and not like a heap, and if a distinct number is composed of distinct units, as they say) but not actually that each of the two (*hekatera*) is one:** The adjective *hekateros* now refers not to the two starting-points but to the units (minimally two) in a number which, if the number is to be one substance and not a mere heap, must be two potentially but one actually.

#### Note 1534

**Just as some others have done—they put together beings from the smallest things:** The others are the atomists, Democritus and Leucippus.

#### Note 1535

**The unit becomes the matter of the numbers, and at the same time prior to the two (*tês duados*)—but also posterior, the two being treated as a whole, a one, and a Form:** Aristotle has earlier said that the one is prior to the indefinite dyad, if the latter, to be a two-maker, must have a dual nature of some sort. Now he is referring not to the dyad—though using the same term *hê duas*—but to the Form number two, which as a Form, is prior to the units that compose it (1084<sup>b</sup>9–13).

#### Note 1536

**Because they were inquiring into the universal they treated the predicable one as also a part in this way. But these characteristics cannot belong at the same time to the same thing:** See B 1 996<sup>a</sup>4–10 (= [P11–12]), 4 1001<sup>a</sup>4–<sup>b</sup>25 (= [P11]), Iota 2 1053<sup>b</sup>9–16, K 1 1059<sup>b</sup>24–27 (= [P8]), 2 1060<sup>a</sup>36–<sup>b</sup>12 (= [P12]).

#### Note 1537

**The same happens here as with number:** See M 8 1084<sup>a</sup>23–32.

#### Note 1538

**Smooth and rough:** See H 2 1042<sup>b</sup>35–36n.

#### Note 1539

**The same puzzle as arises in the case of the several species as species of a genus:** See A 9 991<sup>a</sup>29–<sup>b</sup>1n (= [12]).

**When someone posits the universals:** Reading *ὅταν τις θῇ τὰ καθόλου* with Ross. OCT obelizes *θῇ* (“posits”) as corrupt.

**Whether it is the animal-itself that is in the particular animal or something other than animal-itself:** Reading *πότερον τὸ ζῷον αὐτὸ ἐν τῷ ζῷῳ ἢ ἕτερον αὐτοῦ ζῷου* with Ross for OCT *πότερον τὸ ζῷον αὐτὸ ἐν τῷ ζῷῳ ἢ ἕτερον αὐτοῦ ζῷον* (“or an animal other than the particular animal”).

Note 1540

**If it (*touto*) is not separable:** *Touto* presumably refers to the animal-itself, as a stand-in for any universal Form. What it is not separable from are particular perceptible animals (Z 1 1028<sup>a</sup>33–34n).

Note 1541

**Some people, then, generate spatial magnitudes from matter of this sort:** That is, from various species of the great and the small (1085<sup>a</sup>9–10).

**Whereas others do so from the point:** For example, Speusippus (Z 11 1036<sup>a</sup>12–13n).

Note 1542

**In what way number can come from the one and plurality they make no attempt to explain:** Since the one is form and plurality (= the great and the small or the indefinite dyad) is matter, [a20] is concerned with the unity of matter and form in the case of numbers.

Note 1543

**Those who generate number from the one and the indefinite dyad:** For example, Plato (A 6 987<sup>b</sup>18–27), Xenocrates (F20 Isnardi = Theophrastus, *Metaphysica* 6<sup>a</sup>23–<sup>b</sup>9).

Note 1544

**The same puzzles will follow for mixture or position or blending or generation or other such things:** See M 7 1082<sup>a</sup>20–26 (= [3c]).

Note 1545

**We must inquire also of those who speak in this way:** See M 8 1083<sup>b</sup>36–1084<sup>a</sup>1 (= [a4]).

Note 1546

**In fact mathematical number has been done away with (for the hypotheses they state are special and unmathematical):** To be a mathematical number N must satisfy the relevant axioms and theorems of mathematics. If, instead, N satisfies the principles special to the particular non-mathematical theory in question, it is not a mathematical number.

Note 1547

**Epicharmus:** See F 5 1010<sup>a</sup>6n. Aristotle cites DK B14.

Note 1548

**Concerning the primary starting-points and the primary causes and elements, however, some of what is said by those who speak only about perceptible substance has been discussed in our works on nature:** Probably a reference to *Ph.* I 4–6, *Cael.* III 3–4, *GC* I 1, where the views of the physicists are discussed.

Note 1549

**Those who posit numbers only, and these mathematical ones:** Speusippus. **Must be investigated later:** At N 2 1090<sup>a</sup>7–15, 3 1090<sup>a</sup>20–<sup>b</sup>15.

## Note 1550

**They at the same time posit the Ideas as universal and contrariwise as separable and as particulars. But that this is not possible has been gone through before:** See B 6 1003<sup>a</sup>5–17 (= [P12]), Z 13, and (though less directly) M 8 1084<sup>b</sup>23–32.

## Note 1551

**As we said in our previous discussion:** At M 4 1078<sup>b</sup>17–34.

## Note 1552

**The Platonists set out (*exethesan*) the universal predicables:** On the meaning of *ekthesis*, see A 9 992<sup>b</sup>10–12n.

## Note 1553

**Which was stated before, at the start, when going through the puzzles:** See B 6 1003<sup>a</sup>5–17 (= [P12]).

## Note 1554

**Besides, these thinkers posit the what-a-thing-is as being in each case one:** Reading ἐτι δ' αὐτὸ ὃ ἔστιν ἐν ἑκάστων τιθέασιν with Ross, which OCT brackets for deletion. **The what-a-thing-is:** See M 3 1075<sup>b</sup>6n.

## Note 1555

**Based on the same argument on which in the case of the syllables there will not be more than one instance of the same one:** Reading κατὰ τὸν αὐτὸν λόγον ὅνπερ οὐδὲ συλλαβῶν ἢ αὐτῇ ἄλλῃ καὶ ἄλλῃ with Ross for OCT κατὰ τὸν αὐτὸν λόγον ὅνπερ οὐδὲ τῶν ἄλλων συλλαβῶν ἢ αὐτῇ ἄλλῃ καὶ ἄλλῃ.

## Note 1556

**Scientific knowledge is of universals, as is clear from demonstrations and from definitions:** See Z 15 1039<sup>b</sup>27–1040<sup>a</sup>7.

## Note 1557

**A deductive proof that this triangle has [interior angles equal to] two right angles does not come about unless every triangle has [interior angles equal to] two right angles:** “Containing two right angles is not universal to figures; for though you can prove that some figure contains two right angles, you cannot prove it of an arbitrary figure, nor do you use an arbitrary figure in proving it, since a quadrilateral is a figure but does not contain angles equal to two right angles. Moreover, although an arbitrary isosceles triangle does have angles equal to two right angles, it is not the primary case, since triangle is prior. Thus if an arbitrary primary case is proved to have angles equal to two right angles (or whatever), then this belongs intrinsically and universally to this primary case, and the demonstration holds of this case intrinsically and universally. Of the other cases it holds in a way, but not intrinsically—even to the isosceles triangle it does not apply universally, but more widely” (*APo.* I 4 73<sup>b</sup>33–74<sup>a</sup>3).

Note 1558

**Either the substances composed of them are also universals, or non-substance will be prior to substance:** Reading ἢ καὶ αἱ ἐκ τούτων οὐσίαι καθόλου with Ross, which OCT brackets for deletion.

Note 1559

**The fact that all scientific knowledge is universal, so that the starting-points of the beings must also be universal and not separate substances, involves the greatest puzzle of those mentioned:** The greatest puzzle not just for Platonists, obviously, but for anyone who thinks, as Aristotle himself does, that the starting-points of scientific knowledge must be universals, since this conflicts with the view that the elements of the beings are substantial particulars. See B 1 996<sup>a</sup>9–10 (= [P12]), 6 1003<sup>a</sup>5–17, K 2 1060<sup>b</sup>19–23 (= [P<sub>14</sub>]).

Note 1560

**The capacity [or potential], being as matter universal and indefinite, is of what is universal and indefinite, whereas the activity, being definite, is of what is definite—being a this something of a this something:** The capacity or potentiality is passive understanding, which is universal because it can receive any universal form. When it is activated by a given universal form, however, the active understanding of that form—which is either identical to the form (in the case of intelligible substances, which just are forms) or analogous in structure to a matter-form compound (in the case of perceptible substances, which are not identical to their forms)—is a particular this something (A 7 1072<sup>b</sup>19–21n).

Note 1561

**What the grammarian theoretically grasps, namely, this [particular instance of] A, is an A:** Aristotle also uses this example when he distinguishes between the various ways in which someone can be said to be scientifically knowledgeable: “One way that something can be a scientifically knowledgeable thing is the way in which we would say a human is a scientifically knowledgeable thing because the human [species] is among the scientifically knowledgeable things and the ones that have scientific knowledge. [2] Another way, is that in which we immediately say that the person who has grammatical knowledge is scientifically knowledgeable. . . . In a third way, there is the person who is already actively contemplating, the one who is actually and in the full sense scientifically knowing this letter A” (DA II 5 417<sup>a</sup>22–29).

Note 1562

**If the starting-points must be universal, what comes from them must also be universal, as in the case of demonstrations:** Because a demonstration must be a valid syllogism in the mood Barbara (A 1 981<sup>a</sup>3n(3–6)).

## BOOK NU (XIV)

Note 1563

**The starting-point cannot be a starting-point by being another thing (*heteron ti ousan*):** For the meaning of (*ouch*) *heteron ti ousan*, see A 6 987<sup>b</sup>23n.

## Note 1564

**Just as it appears that nothing is contrary to substance, so too argument testifies to this:** “It also belongs to substances for there to be nothing contrary to them. For what could be contrary to a primary substance? For example, to the particular human there is no contrary, nor even to the human or the animal is there anything contrary” (Cat. 5 3<sup>b</sup>24–27).

## Note 1565

**Some making the unequal matter for the one, the equal:** Reading οἱ μὲν τῷ ἐνὶ τῷ ἴσῳ τὸ ἄνισον with the mss. and Annas (who cites N 5 1092<sup>a</sup>35–<sup>b</sup>1) for OCT οἱ μὲν τῷ ἴσῳ τὸ ἄνισον. The reference is to Plato, whose indefinite dyad of the great and small is equalized by the one (M 7 1081<sup>a</sup>24–25, 8 1083<sup>b</sup>23–24 (= [a1])).

**Another making plurality matter for the one:** Speusippus (N 5 1095<sup>a</sup>35–<sup>b</sup>3 = F38 Tarán).

## Note 1566

**For both the numbers are generated by the substance of the one:** Substance in the sense of form or essence (1087<sup>b</sup>15–16, A 6 987<sup>b</sup>20–21).

## Note 1567

**Some speak of the great and the small along with the one, and treat these three as elements of the numbers:** Plato. The next group mentioned consists of other unknown Platonists. The third, as the reference to a universal “over (*epi*)” things (as in “the one over many”) may be other Platonists, or, as “the exceeeder and the exceeded” may suggest, Pythagoreans. The characterization of all these groups as producing logico-linguistic demonstrations (1087<sup>b</sup>21), however, suggests that all of them are Platonists. See Z 4 1029<sup>b</sup>13n.

## Note 1568

**The demonstrations they themselves carry out are logico-linguistic:** See M 5 1080<sup>a</sup>10n.

## Note 1569

**Other thinkers [1] oppose the other and the another to the one, and others [2] plurality to the one:** [1] Probably Pythagoreans; [2] probably Speusippus.

## Note 1570

**And the measure is indivisible, in kind for qualities and perceptually for quantities, as the one is not intrinsically substance of anything:** See Iota 1 1052<sup>b</sup>1–1053<sup>a</sup>8.

## Note 1571

**Smooth and rough:** See H 2 1042<sup>b</sup>35–36n.

## Note 1572

**Since another thing (*heteron ti*) is [matter] for both the relative generally, and for its parts and kinds:** Reading ἢ εἴ τι ἕτερον καὶ τῷ ὅλῳ κοινῶ πρὸς τι καὶ τοῖς μέρειν αὐτοῦ καὶ εἶδεν with Ross and the mss. for OCT εἴ τι ἕτερον ὑπόκειται καὶ τῷ ὅλῳ κοινῶ πρὸς τι καὶ τοῖς μέρειν αὐτοῦ καὶ εἶδεν.

Note 1573

**Not . . . as being another thing** (*ouch heteron ti*): See 1087<sup>a</sup>33, A 6 987<sup>b</sup>23n.

Note 1574

**An indication that the relative is least of all a substance and a being:** The closest Aristotle comes to making this claim elsewhere is at NE I 6 1096<sup>a</sup>20–22: “what is intrinsically—that is, substance—is naturally prior to relation (for a relation would seem to be an offshoot or coincidental attribute of what is).”

**Is that of it alone there is neither coming to be nor passing away nor movement, nor alteration, nor simple coming to be and passing away:** Suppose that Socrates is taller than Euthyphro at time  $t_1$ , but not taller than him at time  $t_2$ . Did Socrates change in any intrinsic respect between time  $t_1$  and  $t_2$ ? If intrinsic change with respect to a relative (in this case, taller) were possible, then the answer would have to be, yes. But this need not be true. For Euthyphro may simply have grown between  $t_1$  and  $t_2$ , while Socrates’ height remained unchanged. Change with respect to a relative is never intrinsic, the thought is, because it always supervenes on some other sort of intrinsic change.

**Simple coming to be and passing away:** See K 12 1068<sup>a</sup>35–<sup>b</sup>3n.

Note 1575

**All the categories are posterior to substance:** See Z 1 1028<sup>a</sup>10–20, 3 1029<sup>a</sup>12–16, 4 1030<sup>a</sup>28–<sup>b</sup>7, Θ 1 1045<sup>b</sup>27–31.

Note 1576

**If there is a plurality, then, of which the one term, namely, the fewness, is always [predicated]:** εἰ δὲ δὴ καὶ ἔστι τι πλεῖθος οὗ τὸ μὲν αἰεί, τὸ ὀλίγον with Ross for OCT εἰ δὲ δὴ καὶ ἔστι τι πλεῖθος τοῦ τὸ μὲν αἰεί τὸ ὀλίγον.

**There must also be a plurality that is unconditionally many:** Two, as the smallest plurality, is simply few, three is many relative to two, but few relative to the other numbers. If the many and the few are in some sense two things (1087<sup>b</sup>9–12), and the numbers are generated from them also severally, then there must it seems be a number generated from the many alone. It, presumably, would have to be unconditionally many, and not in any sense few.

**Such as the ten, if there is no number that is greater than it:** See M 8 1084<sup>a</sup>12–13.

Note 1577

**What admits of not existing is not eternal, as we have had occasion to busy ourselves showing in another discussion:** Θ 8 1050<sup>b</sup>6–22, *Cael.* I 12.

Note 1578

**No eternal substance can be composed of elements present in it:** See Z 13 1039<sup>a</sup>1–17n.

Note 1579

**There are some people who make the element that is together with the one an indefinite dyad, and object to the unequal:** Xenocrates (M 9 1085<sup>b</sup>6–7n).



## Note 1580

**There are many causes (*aitia*), to be sure, which led these thinkers astray in the case of these causes (*aitias*):** The “many causes” are those of which Aristotle is about to give the most prominent example; “these causes” are the elements he has been discussing.

## Note 1581

**“For never will this prevail, that things that are not are”:** DK B7 = TEGP 16 F7.

## Note 1582

**If things [are said] to be in many ways:** See  $\Gamma$  2 1003<sup>a</sup>33–<sup>b</sup>10, also  $\Lambda$  9 992<sup>b</sup>18–24 (= [29]).

## Note 1583

**He means the false and calls that sort of nature not being, of which, together with being, beings are composed so as to be many:** The reference is presumably to Plato: “This account dared to assume that what is not, is. For in no other way would falsehood have become a being. But the great Parmenides . . . from beginning to end testified . . . ‘never will this prevail, that things that are not, are’” (*Sph.* 237a3–8); “a false belief believes the things that are not” (240d9). In these texts, however, Plato claims only that falsehood presupposes not being, not that the two are identical.

## Note 1584

**Geometers do not assume anything false, either, since it is not a premise of the deduction:** “Nor does the geometer assume falsehoods, as some have said [see B 2 998<sup>a</sup>1–4], stating that we should not make use of a falsehood, whereas the geometer speaks falsely when he says that the line that is not a foot long is a foot long or that the drawn line is straight when it is not straight. But the geometer does not conclude anything from there being this line which he himself has described, but from the things that are shown by means of them” (*APo.* I 10 76<sup>b</sup>39–77<sup>a</sup>3; also *APr.* I 41 49<sup>b</sup>33–37, quoted in  $\Lambda$  9 992<sup>b</sup>10n).

## Note 1585

**Two whites (*leuka*):** See  $\Gamma$  4 1007<sup>b</sup>4n.

## Note 1586

**They would have seen what the cause of multiplicity is in the case of substances too, since the cause is the same or analogous as in the other categories:** See  $\Lambda$  4 1070<sup>b</sup>16–21,  $E$  1 1026<sup>a</sup>27n.

## Note 1587

**There must, surely, be a matter for each category (*genos*):** See  $Z$  4 1029<sup>b</sup>22–25,  $\Lambda$  4 1070<sup>b</sup>18–21.

**Except it cannot be separable from substances:** The matter for color, which is in the category of quality, is surface ( $\Lambda$  4 1070<sup>b</sup>20–21). But a surface is inseparable from the substance whose surface it is, since it cannot exist without it. Similar considerations apply to the matters in the other categories.

Note 1588

**In the case of [1] this somethings, however, there is a reason why (*echei tina logon*) [2] the this something can be many:** The plural "this somethings" in [1] refers to *tade tina*, particular substances; the singular in [2] refers to the substantial form ( $\Delta$  8 1017<sup>b</sup>24-26, H 1 1042<sup>a</sup>27-29,  $\Theta$  7 1049<sup>a</sup>35, A 3 1070<sup>a</sup>11) shared or shareable by a number of particular substances. What explains the distinctness of these substances is their matter, since each is composed of a distinct parcel of it (Z 8 1034<sup>a</sup>5-8).

**Unless there is a thing that is both a this something and a nature such as this (*phusis tis toiauté*):** That is, a thing that is both a particular and a universal, like a Form or Idea (M 9 1086<sup>a</sup>32-34).

Note 1589

**The puzzle here is rather this, how there can be many active substances and not one:** A substantial form of a matter-form compound can be many because matter-form compounds that are the same in form can be composed of distinct parcels of matter. There are substances, however, such as the primary god, that have no matter, are identical to their forms or essences (A 8 1074<sup>a</sup>35-36), and so are essentially active—essentially activities, or actualities (7 1072<sup>b</sup>26-27). The question is, how can they be many? The confident claim that "all things that are many in number have matter" (8 1074<sup>a</sup>33-34) might seem to entail that the answer must be no. But the things referred to are those, like human beings, that are one in form but many in matter. This does not seem to rule out the possibility of different forms or activities being distinct *as forms or activities*. A 8, from which the confident claim comes, is itself devoted to showing that the number of active substances (1073<sup>a</sup>14) that should be posited is fifty-five (1074<sup>a</sup>14-16).

Note 1590

**Unless it signifies a measure or the quantitatively indivisible:** Reading  $\epsilon\iota\ \mu\eta\ \mu\acute{\epsilon}\tau\rho\omicron\nu\ \kappa\alpha\iota\ \tau\omicron\ \kappa\alpha\tau\grave{\alpha}\ \tau\omicron\ \pi\omicron\sigma\sigma\acute{\omicron}\nu\ \acute{\alpha}\delta\iota\alpha\lambda\epsilon\tau\omicron\nu$  with Ross for OCT  $\epsilon\iota\ \mu\eta\ \mu\acute{\epsilon}\tau\rho\omicron\nu\ \acute{\omicron}\tau\iota\ \tau\omicron\ \kappa\alpha\tau\grave{\alpha}\ \tau\omicron\ \pi\omicron\sigma\sigma\acute{\omicron}\nu\ \acute{\alpha}\delta\iota\alpha\lambda\epsilon\tau\omicron\nu$  ("unless it signifies a measure because it is quantitatively indivisible").

Note 1591

**We might also focus the investigation concerning numbers on the question of where we should get the conviction that they exist from:** Beginning here (1090<sup>a</sup>2) and continuing into the next chapter (1091<sup>a</sup>12) is a discussion of the notion of separately existing numbers that differs little if at all from the discussion in M 2-3. The thinker who posits the Ideas (1090<sup>a</sup>4-7) is Plato (also 1090<sup>a</sup>16-20), the one who posits mathematical number (1090<sup>a</sup>7-15) is Speusippus (also 1090<sup>a</sup>25-30); 1090<sup>a</sup>35-<sup>b</sup>5 discusses both alike; 1090<sup>a</sup>20-25, 30-35 discuss the Pythagoreans.

Note 1592

**He speaks of it as being a sort of intrinsic nature (*kath' hautên*):** See  $\Delta$  18 1022<sup>a</sup>32-35 (= [4]).

## Note 1593

**The theorems of the arithmeticians will all apply equally well to perceptible things, as we have said:** Especially at M 3 1077<sup>b</sup>17–30.

## Note 1594

**Those who posit that the Ideas exist and that they are numbers, in virtue of setting out (*ekthesin*) each thing beyond the many and taking each to be one:** See A 9 992<sup>b</sup>10n, M 9 1086<sup>b</sup>10.

## Note 1595

**They saw many of the attributes of numbers to belong to perceptible bodies:** Reading τὸ ὁρᾶν πολλὰ τῶν ἀριθμῶν πάθη ὑπάρχοντα τοῖς αἰσθητοῖς σώμασιν with Ross for OCT τὸ ὁρᾶν πολλὰ τῶν ἀριθμῶν πάθη ὑπάρχοντα ἐν τοῖς αἰσθητοῖς σώμασιν (“they saw many of the attributes of numbers to belong in perceptible bodies”).

## Note 1596

**The attributes of the numbers are present in a musical scale and in the heaven and in many other things:** See A 8 989<sup>b</sup>29–990<sup>a</sup>29.

## Note 1597

**We claim that there are sciences of perceptible things, as we said earlier:** In M 3.

## Note 1598

**Mathematical statements are true and gladden the soul:** In part, presumably, because Forms are numbers, so that these statements are about what the soul resembles and loves: “We must keep in mind what the soul grasps and the kinds of things it longs to associate with, because it is akin to what is divine and immortal and what always exists” (Plato, *Rep.* X 611d8–e2).

## Note 1599

**For even of walking, and of movement in general, there is a limit, so that it would be a this something and a substance. But that is absurd:** See Z 1 1028<sup>a</sup>20–31.

## Note 1600

**Spatial magnitudes would exist for those who maintain the existence only of the objects of mathematics:** Speusippus thought that of the various sorts of numbers, lines, planes, and so on (including Form numbers), only the mathematical ones existed (Z 2 1028<sup>b</sup>20–27, A 7 1072<sup>b</sup>30–1073<sup>a</sup>3, 10 1075<sup>b</sup>37–1076<sup>a</sup>1). But because of the episodic way in which these are generated there is a puzzle about their relationship to each other and to other things.

## Note 1601

**Unless we wish to change the objects of mathematics and produce some special doctrine of our own:** See M 6 1080<sup>b</sup>24–30.

## Note 1602

**Form number, perceptible number:** See A 8 990<sup>a</sup>31–32n.

Note 1603

**If, though, he names some other one, the elements he names will be many:** The “he” is Plato, who, in Aristotle’s view, starts with the One and the indefinite dyad of great and small as elements, and from these generates the Forms (or Form numbers). From the Forms and the great and the small he wants to generate the spatial magnitudes, but this already requires a new sort of great and small, since the original one does not result in spatial entities at all (the Forms are intelligible not perceptible entities). Aristotle’s argument here is that Plato also needs a third sort of great and small (or small and great) in order to produce mathematical number, since it is intermediate between, and so distinct from, Form number and perceptible number. His elements have now become many more than the two he started with.

Note 1604

**The “long story (*makros logos*)” of Simonides:** Simonides is almost certainly Simonides of Cos (A 2 982<sup>b</sup>30n). Just what his *makros logos* was is unclear. Compare H 3 1043<sup>b</sup>26.

Note 1605

**The great and the small cannot in any way generate number except what is got from [the] one by two-making:** The great and the small is the two-making indefinite dyad (M 8 1083<sup>b</sup>36n).

Note 1606

**For they say plainly that when the one had been composed . . . immediately the closest part of the unlimited began to be constrained and limited by the limit:** See A 5 986<sup>a</sup>16–21n.

Note 1607

**They say that there is no coming to be of the odd:** They = Platonists.

Note 1608

**It is evident that they are not positing the coming to be of the numbers [merely] for the sake of getting a theoretical grasp on them:** “The self-defense attempted by some of those who say that the cosmos came to be but cannot pass away is untrue. For they say that they, with their talk of coming to be, are like those who draw geometrical diagrams: it is not that they claim that the cosmos came to be at some time, rather their talk of coming to be is for the sake of teaching, since it makes things easier to learn, just as the diagram does for those who see it coming to be. But the two cases, as we say, are not the same. For in the production of geometrical diagrams, if everything is assumed to exist at the same time, what results is the same, whereas in the demonstrations these people give it is not the same—it cannot be. For the earlier and later assumptions are contrary ones. For they say that ordered elements came from disordered ones, yet elements cannot be ordered and disordered at the same time. Instead, there must be a process of coming to

be separating the two, as well as a period of time. In geometrical diagrams, by contrast, none of the elements are separated in time" (*Cael.* I 10 279<sup>b</sup>32–280<sup>a</sup>10 = Xenocrates F73 Isnardi).

Note 1609

**It is a puzzle, however, and a reproach to being in a puzzle-free condition:** See A 10 993<sup>a</sup>24–27.

Note 1610

**The theologians:** See B 4 1000<sup>a</sup>9–18.

**Some thinkers of the present day say that it is only when the nature of the beings has progressed that both the good and the noble make their appearance:** Speusippus is meant (A 7 1072<sup>b</sup>30–32).

Note 1611

**The early poets:** Hesiod, Orpheus (DK B12).

**Night:** See A 6 1071<sup>b</sup>26–27.

**Chaos:** See A 1 984<sup>b</sup>27.

**Ocean:** See A 3 989<sup>b</sup>3n.

**Zeus:** Considered as a source of goodness (A 10 1076<sup>a</sup>5–6).

Note 1612

**Pherecydes:** Pherecydes of Syros (c. 600–525 BC), placed Zeus at the beginning of things along with earth (Chthonia) and time (DK B1).

**The Magi:** A hereditary caste of Zoroastrian priests. Aristotle in his dialogue *On Philosophy* supposedly identified their two starting-points, Ormuzd and Ahriman, with Zeus and Hades (DL *Prooemium* [8], 88–92).

Note 1613

**It is not because of anything other than its good state (*eu echei*) that it is incapable of passing away:** Compare *eu echei* at A 7 1072<sup>b</sup>24.

Note 1614

**Those who agree that the one is a primary starting-point and element, but only of mathematical number:** Speusippus is meant (A 7 1072<sup>b</sup>30–32).

Note 1615

**Each unit becomes just what is a sort of good (*hoper agathon ti*):** For the meaning, see I 2 1003<sup>b</sup>33n.

Note 1616

**One thinker avoided attaching the good to the one:** Speusippus, again (A 7 1072<sup>b</sup>30–32). Nonetheless, he allowed a looser connection between the two: "The Pythagoreans . . . place the one in the column of goods—indeed, Speusippus seems to have followed their lead" (NE I 6 1096<sup>b</sup>5–7). The one is in the column to which good things belong, but they emerge later than it.

Note 1617

**The bad is the place (*chôran*) of the good:** The idea is that good, which is the object of desire and wish, has its place taken by the bad, which the good now desires to realize or resemble: “For both imagination and perception have the same place (*chôran*) as thought, since all are discerning. . . . And the apparent good may have the place (*chôran*) of the good, as may the pleasant, which is an apparent good” (MA 6 700<sup>b</sup>19–29).

Note 1618

**The matter of what is actively fire is what is potentially fire:** See Z 3 1029<sup>a</sup>20n(3).

Note 1619

**Nor is someone correct in his assumption when he compares the starting-points of the whole to that of animals and plants:** Speusippus held such a view (A 7 1072<sup>b</sup>30–34).

**The one-itself is not even a being:** (1) ‘The one-itself is the ultimate starting-point of the beings. (2) All starting-points are imperfect and incomplete relative to what comes from them. (3) The one-itself is imperfect and incomplete relative to the beings. (4) The one-itself is not even a being.

Note 1620

**It is a human who begets a human, and the seed is not primary:** See A 7 1072<sup>b</sup>35–1073<sup>a</sup>3.

Note 1621

**The ways in which one thing comes from (*ek*) another:** See Δ 24 and Z 7 1032<sup>a</sup>16n.

Note 1622

**Not everything is mixable; what is produced is something distinct:** See A 8 989<sup>b</sup>1–2n.

**The one will not remain separable and a distinct nature:** Since its nature is changed by the mixing process, and so it itself continues to exist only potentially in the mixture (GC I 10 327<sup>b</sup>22–26).

Note 1623

**By mode of combination:** See A 8 989<sup>b</sup>1–2n.

**The elements of a syllable must have position:** See Z 17 1041<sup>b</sup>11–33, H 3 1043<sup>b</sup>4–10.

**And the person who understands the one and the plurality will understand them separately:** See A 9 1075<sup>a</sup>7–9n.

Note 1624

**The case in which they are present as components is possible only for things that come to be:** The idea is that if a thing has components, then these (or some of them) can exist *before* it does, so that it must be something that can come to be later (Δ 1 1013<sup>a</sup>4–7).

## Note 1625

**Is it, then, in the way that things come from seed? But nothing can come away (*apelthein*) from what is indivisible:** *Apelthein* is used to describe the emission of seed by a male in sexual reproduction, where it makes no material contribution to the embryo or offspring: “seed is not a part of the fetus as it develops” (GA I 22 730<sup>b</sup>10–11). If the numbers are imagined to be generated from seed in that way, the case contrasts with one in which the starting-point persists as a constituent of what is generated. If, on the other hand, the case is supposed to be one in which the starting-point persists as a constituent, then the mode of generation is more like that in which a plant grows from seed that, in some sense, remains a constituent of it. In either case, Aristotle’s point remains, that from something indivisible nothing can come as from seed.

## Note 1626

**Everything that comes to be from a contrary also comes to be from something else that does persist:** See A 1 1069<sup>b</sup>3–9.

## Note 1627

**There is, then, something else that persists, from which, together with the other of the two factors (*thaterou*), number is or has been generated:** The Platonists produced number from two contraries, not from one contrary plus an underlying subject. Aristotle uses this, however, simply to show that they imagined the generation of numbers to be from opposites. He then applies his own account of such generation to argue that there must be a second factor (not an opposite) from which, together with one of the opposites, generation proceeds.

## Note 1628

**Why on earth do other things that come from contraries, or that have contraries, pass away (even when they come from all of it):** When gray comes from white by an admixture of black, both contraries remain in it. Since contraries are destructive of contraries, both destructive forces are present, offering a basis for an explanation of its passing away. But when a white thing becomes entirely black, so that the black comes from all of it, no such basis exists. Yet black things pass away just as gray ones do.

## Note 1629

**Whether present as component or not present as a component a contrary always destroys [its contrary]:** See N 4 1092<sup>a</sup>2–3. This applies to numbers, because they are supposed to be generated from contraries (1092<sup>b</sup>1–2).

**Just as strife destroys mixture:** In Empedocles’ system (A 4 985<sup>a</sup>21–29).

**Yet it *should not* do so, since that is not its contrary:** A parenthetical criticism of Empedocles. Strife is the contrary of love and so should be destructive of it not of mixture.

Note 1630

**Eurytus assigned a certain number to belong to a certain thing by using pebbles to copy the shape of living things** (*phutôn*): The idea was to sketch the outline of, for example, a man in colored pebbles, the number of which was assigned to that sort of being as its number.

**Eurytus**: An early 4th cent BC disciple of the Pythagorean philosopher Philolaus of Croton.

**As some people put numbers in the shapes of a triangle or a square**: See M 8 1083<sup>b</sup>30n.

Note 1631

**The number is the matter**: Reading  $\delta'$  ἀριθμὸς ὕλη with Ross for OCT  $\delta'$  ἀριθμὸς ὕλης (“the number is of the matter”). See 1092<sup>b</sup>24n.

Note 1632

**For example, the substance of flesh or bone is number in this way**: Reading οἷον σαρκὸς ἢ ὅσπου ἀριθμὸς ἢ οὐσία οὕτω with Ross for OCT οἷον σαρκὸς ἢ ὅσπου ἀριθμὸς ἢ οὐσία οὕτω.

**Three parts of fire and two of earth**: A definition of the sort Empedocles gave (A 4 993<sup>a</sup>17–18).

Note 1633

**Number, then, is not a cause . . . as matter**: The number that *is* (or is a cause as) matter (1092<sup>b</sup>18) is number of units of earth or whatever (1092<sup>b</sup>19–21), not the mathematical or Form number referred to here.

Note 1634

**Their mixture is expressible by a number, whether easily calculable or odd**: The contrast is illustrated in the following text: “Such, then, is a possible way of conceiving of the existence of a plurality of colors besides white and black, but which are a plurality because of the ratio [of white to black that constitutes them]; for they [white and black] may be juxtaposed in the ratio 3 : 2 or 3 : 4, or in ratios expressible by other numbers, or they may be in no numerically expressible ratio, but in some incommensurable relation of excess or deficiency” (*Sens.* 3 439<sup>b</sup>25–30).

Note 1635

**Honey-water**: A traditional cure, originally made from honey and milk, later from honey and water.

**If it is mixed in the proportion of three times three** (*tris tria*): In a moment (1092<sup>b</sup>32) Aristotle will correct this way of expressing the ratio: it should be *tria pros tria* (“three to three”) not *tris tria* (“three times three”), which may have been the traditional way of giving the recipe for honey-water.

Note 1636

**The number of fire, then, cannot be  $2 \times 5 \times 3 \times 6$  and that of water  $2 \times 3$** : In specifying a ratio  $2 \times 5 \times 3 \times 6$  must mean 2 units of some stuff S added 90 times.



The recipe for water cannot then be 2 units of S added 3 times, since any number of units of S are the same in kind, whereas fire and water are different in kind.

#### Note 1637

**The cause of this is that there are three regions of the mouth and one letter is applied to *sigma* in each:** The three regions are the teeth, the lips, and the palate, against which the tongue is placed in pronouncing *xi*, *psi*, and *zeta*, pronounced as S/DA (A 9 993<sup>a</sup>5–7n).

#### Note 1638

**These people, then, are like the early Homeric scholars:** The reference is probably to allegorizing interpreters of the *Iliad* and *Odyssey*, such as Theagenes of Rhegium (flourished c. 525 BC), who allegedly defended Homer's account of the strife between the gods (*Iliad* XX) as an allegory of the strife between the natural elements.

#### Note 1639

**The middle strings are nine and eight:** The middle strings are the fourth and fifth, which are represented by the ratios 9 : 6 and 8 : 6.

#### Note 1640

**Its number is that of the whole system (*oulomeleia*[i]) of the heaven:** Perhaps because there are 12 signs of the zodiac, 8 heavenly spheres (that of the fixed stars and those of Saturn, Jupiter, Mars, Venus, Mercury, the sun, and the moon), and 4 elements, and  $12 + 8 + 4 = 24$ , which is the number of letters in the Greek alphabet.

#### Note 1641

**None of them is a cause in any of the ways that were distinguished with respect to the starting-points:** See A 3 983<sup>a</sup>24–32, 10 993<sup>a</sup>11–15, Δ 1–2.

#### Note 1642

**The powers of certain numbers:** It may not be the technical mathematical notion of the power of a number (Δ 12 1019<sup>b</sup>33–34) that is referred to, since the square of any number would apparently be in the column of goods (A 5 986<sup>a</sup>26), but a less technical one, in which, for example, it is a power of 24 that is the number of Greek letters, the number of the highest note on the flute, and the number of “the whole system of the heaven” (1093<sup>b</sup>4).

**The column of the noble:** See A 7 1072<sup>a</sup>30–<sup>b</sup>1n.

#### Note 1643

**In each category of being there is something analogous:** That is, something analogous to something in another category.

**Perhaps, in number the odd, and in color the white:** The one, which is odd (M 4 1084<sup>a</sup>36) and odd-making, is a starting-point of number in the Platonic and Pythagorean theories, and so has a role analogous to that of white in the Aristotelian theory of color (Δ 10 1018<sup>a</sup>24–25n), which is why white is form and black its lack (A 4 1070<sup>b</sup>20–21).

Note 1644

**For equal Form numbers differ from each other in form, since even their units do:** The theory of harmony requires equal numbers to be identical. Different Form numbers, however, consist of non-combinable units—units that differ in kind or form, and so, if there were equal ones (it is unclear whether there could be), they would differ in kind too, since their units do.

## Glossary of Greek Terms

αἰσθάνεσθαι	perceive
αἶσθημα	perceptible objects
αἶσθησις	perception, perceptual capacity
αἰσθητός	perceptible
αἰτία, αἴτιον	cause
ἀκίνητος	immovable
ἀκρίβεια	exactness
ἀκριβής	exact
ἀλήθεια	truth
ἀνάγκη	necessary
ἀντικείμενος	opposite
ἀόριστος	indefinite
ἄπειρος	unlimited
ἀπλῶς	unconditionally, simply
ἀπόδειξις	demonstration
ἀποδεικτικός	demonstrable
ἀπορία	puzzle
ἀρετή	virtue
ἀρχή	starting-point
ἀφορίζειν	determine, define
ἀφωρισμένος	indefinite
βία	force
βουλήσις	wish
γένος	genus, kind
γένεσις	coming to be
γνώσις	knowledge
δεικνύειν	show
δηλοῦν	make clear

διαίρεσις	division
διάνοια	thought
διαφορά	differentia, difference
δόξα	belief
δύναμις	capacity, potential
εἰδέναι	know
εἶδος	form, species, kind
ἐναντίος	contrary
ἐνδοξος	reputable
ἐνδοξα	reputable beliefs
ἐνέργεια	activity
ἐνεργεία	actively
ἐντελέχεια	actuality
ἐντελεχεία	in actuality
ἐξις	state
ἐπιθυμία	appetite
ἐπιστήμη	scientific knowledge
ἔργον	function, work
θεωρεῖν	contemplate, get a theoretical grasp on
θεωρία	contemplation, theoretical knowledge
ιδέα	(Platonic) Idea
καθ' αὐτό	intrinsic
καθ' αὐτό συμβεβηκός	intrinsic coincident
καθ' ἕκαστον	particular
καθόλου	universal
κατὰ συμβεβηκός	coincidentally
κίνησις	movement
κρίνειν	discern, judge
κύριος	control
λόγος	account, argument

μεταβολή	change
μεταξύ	intermediate
μονάς	unit
μορφή	shape
νοεῖν	understand
νοητός	intelligible
ὄν, ὄντα	being, beings
ὄρεξις	desire
ὀρίζειν	determine, define
ὀρισμός	definition
ὅρος	definition, term
οὐ ἕνεκα	for-the-sake-of
οὐσία	substance
πάθος	attribute, affection
πέρα	beyond
πέρας	limit
σημαίνειν	signify
στέρησις	lack
στοιχεῖον	element
σοφία	theoretical wisdom, wisdom
συλλογίζεσθαι	deduce
σύνολος	compound
σχῆμα	figure
σῶμα	body
τέλειος	complete
τέλος	end
τέχνη	craft
τί ἦν εἶναι	essence
τόδε τι	this something
τοιόνδε	such-and-such a sort
τὸ τί ἐστι	the what-it-is
τύχη	luck

ὕλη	matter
ὑποκείμενον	underlying subject
φορὰ	spatial movement
φρόνησις	practical wisdom
φύσις	nature
χωρίς	separate
χωριστός	separable
ψυχή	soul

## Further Reading

A detailed and regularly updated bibliography of works on Aristotle's *Metaphysics*, compiled by Marc Cohen, is available online at: <http://plato.stanford.edu/archives/sum2014/entries/aristotle-metaphysics/>

*Thesaurus Linguae Graeca* (<http://www.tlg.uci.edu>) has excellent searchable Greek texts and English translations of Aristotle's writings, with linked dictionaries and grammars.

Not to be missed on Eudoxus' astronomy in  $\Lambda$  8 is: <http://web.calstatela.edu/faculty/hmendel/Ancient%20Mathematics/Eudoxus/Astronomy/EudoxusH-omocentricSpheres.htm>

Editions of the *Metaphysics*, translations of it, and commentaries on it are listed under Abbreviations.

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## Relevant Works of Mine

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- Action, Contemplation, and Happiness: An Essay on Aristotle* (Cambridge, Mass., 2012).
- "Aristotle's Method of Philosophy." In C. Shields (ed.), *The Oxford Handbook of Aristotle* (Oxford, 2012), pp. 150–170.



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